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ORIGINAL COMMUNICATIONS.

ON THE SELECTION OF CASES AND THE LIMITATIONS OF SPECIFIC TREATMENT IN TUBERCULOSIS.

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In the reports issued at intervals from the Winyah Sanitarium since 1892, on the work done in the institution, we have repeatedly called attention to the advantages to be gained in the treatment of tuberculosis by the addition of specific remedies, more especially of those made from the tubercle bacilli themselves, to the climatic, dietetic, and hygienic methods of treatment. We have, however, at all times emphasized the necessity and advantages of the latter as the unconditional requisite for success, since, as we shall explain further on, specific medication, which has for its object the immunization of the patient against the pathogenic action of the specific bacillus, can be applied most successfully only when the cell nutrition is not seriously impaired.

Before the introduction of specific treatment with the products of tubercle bacilli we depended entirely on general methods, which aimed at the restoration and maintenance of a satisfactory degree of nutrition, and we are not unmindful that an apparent arrestment of the disease sometimes occurs without additional aid, and that in a comparatively small percentage, chiefly of early-stage cases, this arrestment can become permanent and amount to a clinical recovery. For the accomplishment of such permanent results many months, and as a rule years, are required, during which the patients must conform strictly to the general methods; they must continue under favorable climatic conditions for years, and, according to many observers, for the remainder of their lives, if they would guard as well as may be against relapses. Cases which have reached a more advanced stage may also improve in like manner. But relapses occur frequently under an ideal course with long-continued residence in the most favorable climate and in cases belonging to the earliest stage, and they are almost the rule when the disease has advanced beyond it.

Inquiries to determine the permanency of results from such general methods, including climatic treatment, made by ourselves and by others have shown that of all cases discharged improved or apparently cured there were less than 10 per cent that had not seriously relapsed or succumbed to their disease in the course of a few years thereafter, and considering that most if not all of these patients belonged to the well-to-do class and could afford the time and expense of being treated at climatic resorts, we can readily understand the pessimistic attitude of many physicians as to the probability of a lasting recovery, under any method of treatment whatever, from pulmonary consumption.

A more general appreciation and the rigorous enforcement of hygienic measures, especially insisting upon a plentiful supply of pure air, and perhaps also an earlier recognition of the disease as compared with conditions twenty years ago, are the chief

points which may justify us in expecting somewhat better results now as compared with those of former years; but now as then the very frequent relapses are the discouraging feature in phthisiotherapeutics, and there is little prospect of a radical change for the better, unless we can bring to our aid remedies which can exert a direct influence upon the tubercle bacillus itself by permanently arresting its further growth and multiplication in the tissues of our patients.

This result we believe to have accomplished with specific treatment in suitable cases, and to the effect of the immunity thereby induced we must attribute our vastly better results obtained in comparatively shorter periods of treatment; nor can we otherwise account for the permanency of the results which we have been able to show in our last report.[1] Nothing has been changed in the management of patients in the Winyah Sanitarium, excepting the addition of specific treatment in 1891. Prior to that time the general methods were carried out as painstakingly as they are now, the average duration of treatment was even longer, and cases with serious tuberculous complications such as of the larynx or of the digestive and urinary organs, in which the prospect was considered bad from the beginning, were not deemed suitable for admission. During the years from 1891, and especially prior to 1900, a number of patients treated in the institution were not given specific remedies in deference to the prejudice of the physicians who had referred them, and in these patients the results were not materially different from what they had been in such cases as had been treated and discharged prior to 1891.

For convenience of comparison we give here the results obtained with and without specific medication since 1888:

(*a*) In 782 cases treated from 1888 to 1908 without specific remedies there were:

Apparently cured ..... 90, or 11.9%
Improved .....238, or 30.5%
Stationary or progressive.....454, or 57.6%

(*b*) In 723 cases which in addition to the usual methods were treated with tuberculin or some of its modifications, the product being derived from the culture fluid upon which tubercle bacilli had been grown to maturity, there were:

Apparently cured .....266, or 36.8%
Improved .....310, or 42.8%
Stationary or progressive.....147, or 20.4%

(*c*) In 1503 cases treated with the Watery Extract of Tubercle Bacilli, the culture fluid not entering into the preparation, there were:

Apparently cured .....834, or 55.5%
Improved .....508, or 33.8%
Stationary or progressive.....161, or 10.7%

In our report for 1905 and 1906, mentioned above, were tabulated the results of over 100 other physicians, who had likewise employed the Watery Extract of Tubercle Bacilli in institutions and general practice. Their material comprised 2183 cases, and the clinical results obtained differ but little from our own. There were:

Apparently cured .....1098, or 50.3%
Improved ..... 639, or 29.4%
Stationary or progressive..... 446, or 20.3%

In regard to the permanency of the results obtained under specific treatment with the Watery Extract of Tubercle Bacilli from 1897 to 1904 inclusively, our inquiry, for the details of which we must likewise refer the reader to our last report, show that of 602 patients traced, after having been dismissed from our care for periods of from two to ten years, there were reported on their discharge as:

Apparently cured 400, and of these had continued without relapse.....320, or 80%
Improved 202, and of these had continued without relapse..... 94, or 46.5%

It would seem to us that the foregoing figures speak for themselves, and that the number of cases dealt with and the period of years covered are sufficiently large to prevent the necessity of making allowance for the natural variation in material or in the statistics themselves.

We have heretofore[1] dwelt upon the advantages which the intelligent general practitioner can derive from studying the subject and from applying specific remedies

[1]Copies of this report may be had on application.

[1]THERAPEUTIC GAZETTE, vol. 31, 1907, p. 393.

in the treatment of certain of their cases themselves, and we have shown that a very satisfactory degree of success has been obtained by physicians not specially trained in phthisiotherapeutics and without the advantages of climatic or sanatorium treatment.

At the present time we desire to call more particular attention to the selection of cases and to the natural limitations in the action of specific remedies in the treatment of the various stages of tuberculosis, be this of the lung or of other organs.

The object of such treatment being to render the organism completely and lastingly resistant to the pathogenic action of the specific bacillus, and this resistance being a cell-function, it is easily understood that an efficient function of this nature or of any other can best be developed and maintained when the cells themselves are normal in their structure and nutrition.

If we accept this proposition as a fact, we see at once the importance of general dietetic and hygienic measures, calculated to maintain normal cell-nutrition if this is not already lost, or then to restore as far as possible any deterioration that may have occurred. The value of such measures wisely adapted to the individual case is generally recognized, and forms the basis of all therapeutic endeavor in the treatment of tuberculous disease.

The favorable influence of normal nutrition without specific treatment is a matter of daily observation by physicians who have the care of tuberculous patients, and it is often sufficient to bring about an arrestment of the symptoms and to check the advance of tubercle formation. This check, however, is very often only temporary; sooner or later there is a recrudescence, and with it the careful observer finds, as a rule, an extension of tubercle formation into new areas which previously had shown no evidence of disease.

Our own blood and clinical studies have shown us that these natural arrestments and new extensions stand in intimate relation to the amount of immune bodies present in the patient's serum; these are formed in response to the absorption of specific toxins derived from tubercle bacilli, more particularly such which are present in recent tubercle. We have further found that in patients badly nourished the natural formation of immune bodies is either slow or there is no appreciable increase, and under a decidedly bad state of nutrition the amount previously present grows less and may be entirely lost, while a new formation of immune bodies does not occur at all. Thus good nutrition favors the arrestment of the disease by checking the growth and multiplication of tubercle bacilli in recent tubercle, but with this arrestment or check there is, on the other hand, no longer supplied the specific toxin for further increase of immune bodies. The degree of such natural immunity acquired in the course of the disease is therefore never high.

In the sera of such apparently arrested cases we find specific agglutinins, amboceptor, and precipitins in small amounts, and these decrease slowly even under the best hygienic conditions, though the immune bodies are not entirely lost for many years. When the nutrition becomes impaired from any cause, but more particularly under the influence of intercurrent diseases, especially infections like influenza, measles, typhoid fever, etc., the immune bodies diminish rapidly and may disappear entirely. This is also the case in the course of hectic fever, associated with caseous softening, and very frequently the latter follows upon the inflammatory processes in the respiratory organs which accompany the affections above mentioned.

Such a decrease or complete loss of immune bodies we have been able to demonstrate under some of the conditions spoken of, and it is our opinion that the loss of all or part of the specific immune bodies explains the subsequent extension of the tuberculous process by allowing new-growth and multiplication of bacilli which may be still living in the tissues.

Inasmuch as the degree of immunity thus naturally acquired is but little if at all in excess over that which is required to check growth and multiplication, a decided reduc-

tion would necessarily suspend this check, and if this occurs before the bacilli in the tissues have died, or before they have disappeared from them, the patient relapses. In this manner extensions alternate with arrestments, probably in frequent repetitions, until such a time when the arrestment has become permanent, or until by secondary destructive processes or complications, with the accompanying fever and exhaustion, no further check is possible, and the patient dies from exhaustion or from complications such as aspiration-pneumonia in the course of a continued softening and excavation.

Instances in which the tuberculous extension is arrested spontaneously and permanently through the development of immunity against the tubercle bacilli are chiefly such in which clinical symptoms have either not appeared at all or have been but slight. They are represented by the autopsy findings of small healed foci or of obsolete lesions; more rarely a lasting result occurs in the same manner in patients who have more advanced lesions but in whom nothing appeared to lower the acquired immunity materially.

If such recoveries occurred frequently, or as a rule rather than as an exception, there would be less reason to propose a supplementing of the naturally acquired immunity. The facts are, however, that the loss of symptoms and the restoration of good nutrition in such cases represent only a check, an arrestment of manifest processes which in most cases is not enduring enough to cause the complete disappearance of living tubercle bacilli from the tissues.

There is no reason to question the proposition that recovery from acute infectious diseases depends upon the intervention of immunity to the action of the related specific bacteria. In all the acute infections immune substances form and increase in the tissue fluids, and are subject to demonstration in the blood serum. The relation of the bacterial toxins to the occurrence of a sufficient degree of immunity has become an accepted fact. The amount of specific toxins liberated and absorbed in acute infections is not only ample to produce the result in a comparatively short time, but is liable to become excessive, and may cause the patient's death before the immunity has reached a degree which will bring about convalescence and recovery. To prevent this contingency, antitoxins have become of value, and their function is to bind and neutralize the excessive specific toxins.

In such acute infections the related bacteria grow and multiply with enormous rapidity; they are present free upon the mucous and serous membranes, or in the tissues, and in the blood; they disintegrate with equal rapidity and set free their toxic products. For these reasons the illness becomes acute and the course rapid.

The contrary is the case in all those infections which we term chronic, and the difference in tuberculosis in its chronic form lies in the slow growth and equally slow disappearance of the tubercle bacilli, in its strictly local form and local extension, and in the production of a local cell-proliferation which constitutes tubercle. This tubercle forms in the interstices of tissues, preferably occupying the lymph spaces, and extends through their channels, blocking up at an early period the paths through which the specific toxin can reach the circulation. Additionally hindering the absorption of the latter is the early degeneration and caseation of tubercle and their non-vascularity, and, as indicated before, it is chiefly from the forming or newly-formed tubercle that the toxins become available for autoimmunization. The caseous tubercle without vessels or lymph spaces can only supply toxic products when it has softened, and even then there is reason to believe that the specific bacterial toxin has become modified if not entirely used up by biochemic changes that have caused the cell necrosis.

Our studies have led us to formulate this view of the problem, and our clinical experience with a large number of patients treated both without and with specific remedies appears to give us ample confirmation. We believe therefore that if a

sufficient degree of immunity could obtain spontaneously, tuberculosis would become a self-limited disease, the same as we see it in acute infectious diseases. We have found that if this increased degree of immunity is supplied artificially at the proper time, the result is precisely the same: recent tubercle disappear, visible tuberculous ulcerations heal more readily, and new extensions of tubercle-formation do not occur.

In cases in which the disease has not as yet caused large caseous tubercle, in which there is no disintegration of tissue, and hence no softening and impending excavation, and in which the nutrition is still good, immunization is accomplished readily, and the patient recovers without any additional treatment. Such patients have not reached symptoms of a severe degree and correspond to our so-called early stage of limited one-sided apex affection, with slight degrees of fever, or afebrile in their course, and usually without cough or expectoration, unless a slight hacking cough is produced by local irritation.

Comparatively few such cases are diagnosed as tuberculosis, yet they react to tuberculin and frequently give a positive reaction to Calmette's or to v. Pirquet's method, or to both. The blood shows the presence of specific agglutinins, precipitins, and amboceptor in a slight degree, and some of these specific tests are often necessary to form a correct diagnosis. The chief subjective symptoms are a certain degree of malaise, with perhaps loss of appetite, when there occurs a corresponding loss in weight. All these symptoms disappear spontaneously if the mode of life is in conformity with hygienic requirements, only to recur again later with perhaps greater intensity when the slight degree of immunity induced during their presence has again been reduced.

Owing to the recurring extension of tubercle the areas involved become larger, and by connective tissue formation or by caseous and inflammatory changes in the older deposits the physical signs become more evident. In more recent deposits the respiratory murmur is of a rough character or it may be weaker; in older deposits it is as a rule harsh and has sometimes a bronchial element. During quiescence there are no catarrhal signs, neither is there as yet decided cough or expectoration. In this stage the pulmonary tuberculosis is said to be latent, and the health is not disturbed unless there is a temporary repetition of a slight febrile movement with more or less malaise, etc., which corresponds to the formation of new tubercle.

Patients who come under professional care have, as a rule, passed through a number of similar attacks, perhaps entirely unnoticed, and they date the onset of their illness from a period of more decided local or general symptoms and signs. In some cases it is the advent of localized pleural pain referred to the corresponding apex, or the shoulder; in others there is more marked fever, with loss of appetite and weight, and the cough becomes more noticeable. As a rule these more decided febrile symptoms correspond to softening of caseous tubercle, and under the induced loss in appetite, and with the decline in general health and of specific resistance, new tubercle-formation coincides or follows.

If the softening of tubercle involves a larger focus, the general symptoms continue until there is an outward discharge into a bronchus, and then there is more marked cough with more or less expectoration, which now contains tubercle bacilli. In instances in which there has been but a single focus of softening, and when there exists a free exit to the liquefied caseous detritus, the fever subsides, the nutrition improves, the immune bodies again increase, and the recent extension is once more checked. Many patients lose all symptoms, including cough and expectoration, and are erroneously considered to be cured. Sooner or later there occurs a repetition, new caseous foci form, soften, and excavate, often in connection with colds, bronchitis, or attacks of influenza, at other times without apparent cause, and the status phthisicus becomes more evident;

the previous good state of nutrition and general resistance is not so readily restored by hygienic, climatic, or other modes of treatment, and the forced feeding now likely to be resorted to frequently fails, or actually brings about gastrointestinal complications, when it is carried beyond the capacity of the digestive organs. The great majority of our patients have reached this or a more advanced stage, and it is then that the question of selecting cases for specific treatment becomes an important one. In the relatively small number of cases representing an earlier stage, in which there is as yet no softening of tubercle or serious decline in the general nutrition, and in which the fever is slight or absent, specific treatment is always indicated if we would assure a permanent arrest and recovery.

In order to select our cases intelligently we need to bear in mind what we may reasonably hope to accomplish by further immunization, and under what conditions we can induce it best and most rapidly. The production of immune substances is a cell-function, and like any other function requires normal or at least a fair degree of cell-nutrition. The latter is reflected by the general nutrition, and when this is poor and declining, the chances of successful immunization are equally so. Thus patients with higher degrees of fever, when already emaciated and still losing weight, are poor subjects for immunization, while in instances of marked cachexia there is no response whatever. While we would exclude such cases until a better state of nutrition is obtained, in all other cases we must first consider the prospective benefits; these, as already stated, are: (1) Protection against the formation of new tubercle—that is to say, against local and general extension of tubercle into heretofore normal tissue; (2) removal of tubercle more recently formed, having not as yet reached the form of larger conglomerate tubercle; (3) the more ready healing of tuberculous ulcerations.

While these benefits accrue to all patients whose general cell-nutrition is favorable, and in whom it continues so during the treatment, any degree of immunity will avail nothing when through further caseous softening, suppuration of excavated areas, or the presence of complications the nutrition again declines, and the patient may die exhausted or from intercurrent complications, though he possesses a high degree of immunity against the tubercle bacillus. Such immunity does not protect against a fatal hemoptysis from an aneurismal sac in a lung cavity; it does not protect against local inflammation due to other causes than the action of the tubercle bacillus; it cannot prevent the perforation of a lung cavity or even protect against autolytic changes in caseous areas or their invasion by other bacteria, under which the caseous tissue may break down. Much less can it enhance or restore normal nutrition, when this is lost, or is declining from other causes.

The physician who contemplates the question of utility of specific treatment must therefore do this in the light of the present state of the patient's general condition, and that of the pathological alterations which he infers from the physical signs to have occurred. If he concludes that the nutrition can be improved, or, if this is still fair, that it can be maintained, and if the symptoms indicative of progressive softening and suppuration are absent, if there are no serious non-tuberculous complications, then the case may be considered as suitable, and a trial is then not only justified but is imperatively indicated. Thus we would immunize a patient, if we felt that by the removal of the present recent tubercle and by preventing further extension of the tuberculous process the patient could reasonably hope to recover from the lesions now existing. On the other hand, we would delay specific treatment in cases which owing to present softening, pneumonic or other local inflammations have higher degrees of fever than 100° or 100.5° F. until the excavation is completed and drainage established, or until the inflammatory complications have subsided.

In such cases there is, as a rule, a decline in weight, and few pass through the condi-

tion mentioned without material injury to their nutrition. In the advanced stages of the disease these acute processes often continue and they represent the beginning of the end. In all such cases it is therefore best to await the outcome of the acute processes, and after their subsidence to consider whether there would be a materially better prospect for the patient's improvement if he had the advantages which a higher degree of immunity can confer.

From the foregoing considerations it is evident that the benefits of specific treatment are greatest at a period of the disease in which destructive changes in the tuberculous areas have not yet occurred, or when the softening material has found an outlet into a bronchus, and the cavity is drained. Such cavities become clean more quickly, are less liable to enlarge and extend under a high degree of immunity than without it.

It is no small advantage to a patient in an advanced stage when his recent tubercle disappear and new tubercle no longer form locally or in distant parts, although the advanced lesions cannot likewise be made to disappear. Our problem is then to deal with the damage that has been done prior to the establishment of a sufficient degree of immunity. When the damage already done is moderate in degree, we can often succeed in restoring the patient to a fair degree of health and usefulness, and frequently attain an entire healing of ulceration and cavities, neither of which would have been possible if the removed living tubercle had likewise caseated, softened, and if new cavities had formed, if a successive eruption of new tubercle had perpetuated the process.

Those who have no experience in the use of specific remedies or who base their judgment upon experience with the old tuberculin, especially with a bad selection of cases and unsuitable doses, may still doubt the advantages which we claim, or may be fearful of injury to their patients, similar to the recorded disasters in the early period of their introduction. Such colleagues we refer to the published results obtained by us and by many others who have followed our advice and employed what we consider to be the most effective product of the bodies of tubercle bacilli, which has been shown to be absolutely safe in their hands, as in our own, in the administration of at least from ten to fifteen million single doses, since its first introduction in 1897.

We frequently note that the Watery Extract of Tubercle Bacilli[1] is classed by writers with tuberculin, and the results from the latter are compared with those obtained by its use to its disadvantage. This is absolutely unjustifiable and shows plainly enough that such writers do not take into consideration that tuberculins, under whatever names they may appear, are prepared from the fluid upon which tubercle bacilli have been grown, whereas the watery extract, as well as tubercle bacilli emulsions, represent the bacillary substance itself, which is required for bacterial immunity.

The emulsions of the tubercle bacilli are often equally efficient with the watery extract for immunization. They have, however, the disadvantage that the immunizing substances must first be liberated and extracted in the organism, after their introduction, that the effect after repeated doses is liable to become cumulative, and that an exact dosage is difficult or impossible. Additional objections to the emulsions are that they often contain clumps and larger coherent masses of tubercle bacilli which are retained at the point of injection, where they may remain unchanged or encapsulated for long periods of time; and finally, that the bacillary bodies contain other substances which we consider at least undesirable if not detrimental to the patient, and which are removed in the preparation of the Watery Extract of Tubercle Bacilli.

Tuberculins—*i.e.*, preparations from the culture fluids—act chiefly as stimulants upon the periphery of tubercle, and often cause local inflammations which are dangerous. They also produce a degree of immunity, by specific proteins derived from

[1]The mode of preparation of the Watery Extract of Tubercle Bacilli has been published in this journal, vol. 21, 1897, p. 388.

the bodies of tubercle bacilli, especially if the preparation is made from very old cultures, in which the bodies of some of the tubercle bacilli have become desintegrated, and their proteins extracted or dissolved in the fluid upon which the bacilli were grown. This immunity produced during the administration of tuberculins is of necessity slight at best, and frequently not sufficient to accomplish the purpose of specific treatment, which is, as we have shown, to permanently arrest the growth and multiplication of the tubercle bacilli in the tissues.

It also appears from our studies that the preparations derived from the bacillary bodies themselves can, and do in properly selected cases, exert this action upon the tubercle bacilli, and therefore upon the tuberculous process. For this reason, whatever product the physician may elect to employ in the specific treatment of tuberculosis, he should exclude those preparations which are made from the culture fluid and choose between emulsions of tubercle bacilli and the watery extract of their bodies, if a high degree of specific immunizing effect is desired.

TREATMENT OF FACIAL NEURALGIA WITH INJECTIONS OF ALCOHOL LOCO DOLENTI.

BY ALFRED GORDON, M.D., PHILADELPHIA.

Facial neuralgia can be justly considered as one of the most rebellious affections. Internal medications, such as coal-tar products, sedatives, and strychnine, may sometimes give temporary relief. Surgical intervention, such as excision, section, or extirpation of the diseased nerve, may, it is true, give permanently good results. But this is not always the case. Recurrence of pain after an operation is not infrequent. Even the most radical operation, viz., extirpation of the Gasserian ganglion, does not always yield satisfactory results. At all events the severe operations are not invariably accepted by the patients and should be resorted to as a last measure.

Alcoholic injections into the nerve, or rather into the foramina from which the latter emerges, have been undertaken very recently by some physicians, particularly abroad, and also in this country (see Patrick and Hecht, *Journal American Medical Association,* 1907). They all advocate deep injections, to wit: for the inferior maxillary nerve, just after its exit from the foramen ovale; for the superior maxillary branch, just after its exit from the foramen rotundum; and for the first branch of the fifth nerve, immediately after its entrance into the orbit. The works of Lévy and Boudoin (*Presse Médicale,* April 17, 1906) and of Patrick and Hecht (*loc. cit.*) show very satisfactory results. It stands to reason that in order to penetrate deeply into the bones of the face and strike precisely the nerve affected a thorough knowledge of the anatomy of the head is essential, and considerable experience is necessary. Moreover, sight should not be lost of the fact that anomalies and cranial and facial variations are met with, so that the foramina in question may vary in their location in relation to other points. Uncertainties, therefore, as to placing the solutions of alcohol are to be counted with when deep injections are planned. If deep injections are followed by good results, similar effects may be obtained from injections into the peripheral end of the nerve-trunks. Such cases have been reported.

The writer has had two such cases recently, and the improvement is so great that he feels warranted in reporting them. In both cases identical injections were made and almost identical results obtained.

Case 1.—Man of thirty-eight, tailor, was a sufferer from infraorbital neuralgia on the right side for nine years. During the last year the condition became so aggravated that on many occasions he had to give up

his work. He finally lost his appetite, began to lose in weight, and could not sleep. When he came under my care in the Neurological Department of the Mt. Sinai Hospital about seven months ago I submitted him first to a course of treatment with strychnine in increasing doses. The latter unquestionably improved his condition, but finally failed to give him relief. I then proposed to him injection of alcohol into the nerve. Dr. M. Stera, the surgeon of the hospital, had upon my request injected about 7 minims of 80-per-cent solution of alcohol directly into the infraorbital foramen without any preliminary local anesthesia. After the needle of an ordinary hypodermic syringe had penetrated into the foramen, an attempt was made to puncture the nerve. The needle probably touched the nerve, as at the moment this was done the patient exhibited pain. The relief was instantaneous. He left the operating-room totally relieved. Two or three hours later the corresponding side of the face began to swell. On the next day the swelling was so large that it almost occluded his eye. The swelling lasted about two weeks, but then gradually decreased and finally disappeared. As to the pain, there was only a tenderness over the injected area, but when the swelling disappeared the tenderness was also lost. The characteristic symptoms of neuralgia, viz., the paroxysmal pain and the tender spots, were totally absent. About two months later he returned with a slight recurrent pain, but the latter lasted only a few hours. It is now the fifth month since the alcoholic injection, and the patient is totally free from pain, which prior to treatment existed for nine consecutive years without intermission.

Case 2.—A middle-aged woman, an old migrainic, began about two years ago to suffer from supraorbital neuralgia on the right side. The pain was so severe and the intervals between the individual paroxysms were so brief that the patient became despondent, could not sleep, and refused food. When she came under my observation, I endeavored first to improve as far as possible the migrainic condition, which I believed was the predisposing cause for the neuralgia. An appropriate diet and hygienic measures were advised, and the patient was put on a course of treatment with strychnine. Improvement undoubtedly followed, but the neuralgia did not totally disappear. A treatment similar to that in the first case was proposed and readily accepted by the patient. The same immediate and remote results followed, viz., swelling of the forehead and of the orbital regions, and instantaneous disappearance of pain. There was no recurrence of neuralgic pain during the last five months, but the migrainic attacks continue, as it is to be expected. Only a few days ago (at the time of writing these notes) she returned with some vague pin-like sensations in the supraorbital region, but there is not the characteristic severe paroxysmal pain of true neuralgia.

Remarks.—While five months is not a sufficiently long time for drawing definite conclusions as to the efficacy of the treatment, nevertheless it is quite significant to note the remarkable improvement in such a brief period of time after a continuous suffering (nine years in the first case and two years in the second), also the facility with which the treatment can be carried out. In view of the latter circumstance similar injections into the peripheral nerve trunk can be repeated several times, should the pain recur. If the improvement continues, this treatment is certainly by far superior to the deep injections, which, as we have seen above, are surrounded with difficulties and uncertainties, and also with some danger even in the most skilful hands. The effect of this small surgical interference is so striking that it deserves the special attention of those who are frequently called upon to treat that distressing affection, facial neuralgia. My two patients have greatly improved in a general way: the mental depression, insomnia, and anorexia have totally disappeared, and the first patient is now able to attend to his work.

As to the mode of action of alcohol upon the neuralgic nerve, one can only form a hypothesis, as there is no anatomical control. What is certain, the nerve fibrils them-

selves are not affected by the fluid. If they were, one would expect objective sensory disturbances in the area of distribution of that particular nerve. In my cases a careful test for all forms of sensations (touch, pain, and temperature) immediately after the injection, as well as two weeks, three weeks, and five months later, revealed no alteration whatever. The sensations are all preserved.

In a contribution to the pathology of neuralgia (*New York Medical Journal,* July 21, 1906) I have shown the frequent involvement of the interstitial tissue besides the nerve fibrils themselves. It is possible that alcohol (80 per cent) has some altering effect on the proliferated interstitial tissue (endoneurium, perineurium, or epineurium) and in this manner relieves perhaps the pressure upon the sensory nerve filaments, the irritation of which maintains the tenderness of the nerve trunks. There are no anatomical means for verifying this contention, but the clinical observation and the above mentioned pathological data warrant the deduction.

In conclusion I wish to emphasize the necessity of a wider trial of such a simple procedure, as utilized in my two cases, in the treatment of that distressing affection called facial neuralgia.

STYPTICIN IN UTERINE HEMORRHAGE.

BY HENRY I. BERGER, M.D., INDIANAPOLIS, INDIANA.

It is the scope of this article to demonstrate the selected classes of cases in which stypticin heads the list of the so-called uterine hemostatics. Before the practitioner decides upon the hemostatic, it is necessary that he should have a thorough understanding of his case, and the object that he wishes to accomplish. After presenting the following cases, which I had the opportunity to observe closely, I will summarize the value of this hemostatic in the cases of menorrhagia and metrorrhagia, or collectively spoken of as "uterine hemorrhage."

Case 1.—Mrs. L., married, had two children, and both are living. Missed two periods, and not wishing to have any more children confided her secret to a dear "friend," who instructed her to purchase some "patent pills," which she did, with the result that in a few days she began to bleed profusely and discharge large clots. Being exsanguinated and growing weaker each day, I was called to the case one week after the appearance of the bleeding. Being suspicious of abortion, I succeeded in getting the patient to admit that she had produced the abortion herself. On examination large clots were disclosed, and I found several pieces of placental tissue upon following the examination with an antiseptic douche. Having no fever, which is indicative of the absence of infection, I decided not to disturb the uterus, and thus selected a non-operative plan of treatment. Ergot was administered with the intention of expelling the remaining secundines, which was successful, but the bleeding continued. Having emptied the uterus I decided to use stypticin to control the hemorrhage. I prescribed stypticin gr. jss in powder form to be taken every three hours. At my next visit I learned some gratifying news in so far as the hemorrhage was concerned. The patient had only taken four doses and the bleeding had almost entirely ceased. On the other hand, not remembering that this alkaloid had a bitter taste, I prescribed it in powder form without using anything else to disguise the taste. Owing to this bitter taste the patient made an earnest appeal to me to change the medicine. I procured some capsules, emptied the powder into them, and thus continued the treatment. The best way to administer stypticin is to use the sugar-coated pills. Although the hemorrhage ceased completely in three days, I ordered the patient to remain in bed for another week, and she made an uneventful recovery. Examination three weeks later revealed the absence of either subinvolution or displacement.

Case 2.—Mrs. W., aged nineteen, married

only three months. Was hurriedly summoned to the bedside of the patient, who complained of a severe "earache" and cramps in the "stomach." Being young and newly married the patient was somewhat reticent in giving me a correct history of the case. Her husband, perceiving this, called me to one side and told me that his wife had skipped two periods and that she became sick this morning, May 3, 1909. I directed my attention to the ear, only to find a normal drum and no signs whatsoever indicative of oral disease. By complaining of an earache the patient evidently intended to deceive me, but remembering having heard of similar cases treated by other physicians my suspicions were aroused as to whether or not the generative organs were the seat of the trouble. Furthermore, the laity are in the habit of referring to the abdominal cavity as their "stomach," and therefore I resorted to abdominal palpation, and found that her "stomach" was situated directly underneath the pubis. Putting these facts together—*i.e.*, bleeding from the uterus, uterine pains, and pregnancy—I decided that I had to deal with a case of threatened abortion, although I did not succeed in making her admit that she attempted to terminate her pregnancy by artificial means. Her husband told me that under no condition if I could possibly help it should I allow his wife to miscarry. My plan of treatment was to quiet her and control the pains, and to control the hemorrhage. Tincture viburnum co. N. F. III in hot water answered the former indication, while stypticin in the form of sugar-coated pills (two pills, each gr. ¾) stopped the bleeding in thirty-six hours. At the end of this time I examined the cervix and found that the os was firmly contracted. After the pains and hemorrhage had ceased the patient remained in bed a few more days and then resumed her housekeeping. She is now gaining in weight and her pregnancy is continuing, and it is my opinion that she will go on to full term.

Case 3.—Miss F. D., single, aged twenty, came to me complaining of excessive menstruation for the past eight months. Father is a consumptive. One brother was operated for a psoas abscess. Physical examination showed no signs of tuberculosis in the chest. Examination of the sputum was also negative. Patient gave a history of losing a few pounds during the past year. Everything else was negative. I concluded that I had to deal with a case of menorrhagia, which ran the patient down, yet keeping the suspicions of tuberculosis to myself. The plan of treatment was as follows: Stypticin administered one week prior to the date of the expected menses and continued during the period (doubling the original dose) accomplished the desired purpose. While heretofore the patient menstruated six days, she now ceases to flow at the end of four days. Under this treatment with stypticin and cod-liver oil the results obtained were very satisfactory.

Case 4.—A woman, aged 45, gave a history of diabetes, otherwise negative. It was only after the bleeding had been in progress for two weeks that an aunt consulted me regarding the patient's condition. She informed me that the bleeding was not continuous, but remitted several times during the past two weeks. Many thoughts flashed through my mind, and on the spur of the moment I was unable to decide upon the diagnosis or the treatment. However, I knew that the bleeding must be stopped, and here did stypticin shine brilliantly. I gave the aunt about three dozen sugar-coated pills, with instructions as to the method of using them, and told her to tell the patient to consult another physician, whose diagnosis I would gladly hear for reasons that were self-evident. I was only partly satisfied when I saw the patient take these pills, because she did not take them as often as directed, and wholly dissatisfied because she did not consult another physician. After seven days the aunt informed me that the bleeding had ceased entirely. While not knowing the exact cause, I was fully satisfied with the results from stypticin. Two months have already passed without recurrence of the bleeding.

Many more cases could be cited to uphold stypticin as being the most efficient hemo-

static, but not wishing to consume too much of your valuable space I will therefore summarize the virtues of stypticin and the interesting features of the preceding cases, to enable my brother practitioners to have a short, concise, and handy reference whenever they may have occasion to employ stypticin in their practice, and want to know facts.

(*a*) In all cases of hemorrhage from the uterus, determine the cause, and treat each case on its own merits, bearing in mind the relative greater frequency of miscarriages, and take measures to protect yourself.

(*b*) Select the proper hemostatic. In all cases of uterine hemorrhage, in the absence of foreign bodies in the uterus, such as secundines (tumors, as polypi and cancer, are also included, for these should be regarded as foreign bodies), stypticin should be thought of as the "first aid to the injured." When there are bits of placenta remaining in the uterus, such as occurs after incomplete abortion, first empty the uterus by using ergot, then prescribe stypticin to stop the hemorrhage.

(*c*) Stypticin is very effective in controlling excessive menstruation. Its administration should be begun several days prior to the expected period.

(*d*) In obscure cases of hemorrhage from the uterus, stypticin is the superior hemostatic to be employed. If you know the cause treat the underlying condition.

(*e*) Not all cases of incomplete abortion require curettage, for when the uterus is emptied stypticin will almost always stop the bleeding.

(*f*) The usual causes of hemorrhage from the uterus are local, and stypticin should be administered almost as a routine, because there are no dangers connected therewith and its action is nearly always a foregone conclusion.

NUTRITION IN ITS APPLICATION TO HEALTH.

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In the February, 1909, number of the THERAPEUTIC GAZETTE I wrote a short article on the "Art of Right Living" as applied to diet, and I have thought it not objectionable to continue the subject a little further in connection with the fundamental principles that operate for the production of health in the tissue cells. I refer to nutrition, excretion, and exercise, a knowledge and due observance of which are largely responsible in influencing and promoting a robust and vigorous constitution; and although there are other closely allied subjects which play an important part, such as rest, sanitation, and rules for the avoidance of contagious diseases, still a knowledge of the proper nutrition of the body, the proper excretion of waste products, and the proper amount of exercise will place one in a favorable position to carry out all the requisites for obtaining and enjoying good health. This appears to be the trend of modern medical education, for although there will be found a dozen hacking at the branches of evil to one who is observed striking at the roots, yet the admission must be made that prevention of disease ought to take precedence of its cure.

Now in considering the subject of nutrition, one must avoid the great blunder of modern schemes, viz., the forcing of all human beings into the same mold. This mistake is very noticeable not only in reference to food but also to exercise—for instance, where a class of boys or girls are all put through the same physical instruction.

In reading the "Autobiography of a Military Man" I find the remark, "The weather being very hot and sultry and as we were under detention in this place for a fortnight, I abstained largely from animal food and remained perfectly well, while my men, who followed their own inclinations and ate the regular ration of meat, etc., were all more or less indisposed, some being quite ill." This officer, I may say, was probably governed by former experiences of the ill

effects of animal food when the temperature was high and little exercise possible, or by that uncommon quality which is usually designated "common sense," but not so with the men who took the same ration day after day.

In speaking of meat I may remark in this connection that Chittenden warns us to beware of an excessive quantity of protein food at all times, and advises as low as 40 or 50 grammes daily. I have stated in my former article that it is the proteids which are responsible for so many ills, and this statement cannot be too strongly emphasized, but when taken in too great quantity there should at least be an endeavor made to have the process of digestion accelerated. The food should be quickly utilized and the waste products thrown out without delay, necessitating an active condition of the excretory organs; for there is this fact worthy of note, that the intermediate catabolic products are decidedly injurious to the tissues, and they should be quickly converted in the final excretory products and cast out.

In order that digestion be not delayed, a plentiful supply of oxygen is one necessity, and this means good air, with lungs not too defective, and a daily active condition of the bowels is a *sine qua non*. Without this eliminative process going on we cannot hope for or expect to find pure blood, free use of the muscles, and perfect nutrition, and as no two individuals are exactly alike in all respects, each one differing in a greater or less degree from all others, it becomes an impossible matter to formulate precise rules for the quantity and kinds of food which are suitable and necessary for the whole human race. Each individual is a unit in himself and requires to be studied as such; not infrequently he will strike his proper diet from personal experience and go through life a healthy and happy man. There are cases, however, that a physician comes in contact with—and how many families are there of this class?—where you find one man who tells you that he is never ill, and you discover a hundred who have their little indispositions, and these minor ills are almost always caused by ignorance or indiscretion in what one eats or drinks, or at any rate by some defect in nutrition which may be provoked by insufficient exercise or excretion. Perfect nutrition infers perfect health, and deviations from it mean ill health. A man certainly may take more than sufficient proteids if he lives an outdoor life and his excretory organs are very active, but let the same man change to a sedentary life and live on the same diet and he will surely suffer inconveniences in health. When this man's waste is reduced from leading an indoor life he does not require tissue-building food, and if he continues to take it, storage in the tissues of the catabolic products is the result, with its inevitable consequences of impaired nutrition.

A few persons who are forced to become idle and are much reduced in weight from overwork may for a time indulge in protein foods with advantage, but let them beware not to continue this kind of nourishment for too long a period, otherwise they will surely come to grief. If the principle be noted and acted upon, that waste calls for repair and that only the proper food be taken in kind and quantity to accomplish this result, then we might say that we had arrived at a satisfactory consideration of the proteids.

To be of any use, however, an article like this must be practical, and as it is, in the great majority of cases, impossible to dictate or state exactly how much proteid is necessary, we can best follow Chittenden's advice and say, "Beware of excessive proteids at all times." In all wasting diseases the proteids are called for in considerable quantities, but they are of little value even in these diseases if sufficient vital energy be not present to digest them, hence the carbohydrates become a marked necessity to enable the proteids to be made use of. To illustrate how necessary these carbohydrates are in an enfeebled body, take the example of a man who has undergone extreme fatigue in running. We would not give this party a beefsteak to revive him but a vitalizing drink containing an energy-giving food, and in speaking of fatigue in connec-

tion with exercise, if we take the classification of Tissié, we have (1) slight fatigue or lassitude which gives tone to the body; (2) fatigue which irritates, excites, and enervates; and (3) fatigue which weakens. It is only the first degree which ought to be recommended for the health of the body and perfect nutrition. Fatigue which irritates, enervates, or weakens ought to be absolutely prohibited under all circumstances, but exercise should be sufficient for all the needs of the body, to develop the muscles and to keep them free to act in all emergencies. A set of muscles that exhibit marked stiffness the day after exercise have not been kept in proper condition; all the muscles of the body should have their daily exercise to the point of very slight fatigue, but anything of an excessive nature brings about high temperature, which, no doubt, is a necessary fever to destroy the toxic matters in the blood.

It may be said that excessive exercise is not only injurious to the muscular system, but also to mental activity. What amount of exercise is normal with one individual may be pathological with another, so that after all the practical rule to adopt is to avoid excessive fatigue as the only safe and reliable one; hence all physical exercises taken in classes must be faulty, for when one boy or man is hardly feeling the training another is completely tired. A boy should be taught the principles of physical culture and then should be allowed to act for himself, either in a gymnasium or in his own bedroom, which latter is, in many respects, preferable, for there he can, after rising in the morning and before retiring at night, practice with discretion the various muscular movements that are essential to health. A few minutes occupied on these two occasions will be all that is necessary, provided his occupation is not entirely sedentary.

On the other hand, if a boy goes to the gymnasium three times a week, or even every day, he will be almost sure to fall into the error of overfatigue—not necessarily so, however, everything depending upon his discretion.

The people of this continent are very much in need of a simpler mode of living, a simpler diet, and a greater knowledge of the physiology of nutrition and exercise, and it is gratifying to note that steps are being taken in the United States and also in Canada for the introduction of a more thorough system of physical culture. It is to be hoped that these body exercises will be under the supervision of able men, who will be in positions of great responsibility, and who will have it in their power to largely control the health of coming generations. This ought to be one of the greatest movements of the day, viz., the adoption of practical measures for the improvement of the physique of our people. There are many side issues that will necessarily have to be considered, but proper exercise and proper food ought to take precedence of all others in the building up of a great nation. Defective nutrition, due in great part to excessive proteids and faulty excretion, accounts for the changed type of Englishman as seen to-day. He is now what one might style a nervo-bilious man, and differs from his grandfather in being compelled to live a more abstemious life; little errors in diet cause him discomforts; he is unable to drink heavy port wines, but prefers clarets and lighter beverages. He may not be an inferior man to his ancestors, but he takes matters more seriously, is less buoyant and optimistic, qualities which are not suggestive of the highest intellect. We have here an example of the influence on the race of the diet of one's forebears.

There is to-day a very large class who suffer from defective excretion, and these men and women are our patients. Many of them may be easily kept in fair health, but require continuously some little artificial stimulant for their excretory organs. To say that they have inherited this faulty condition is only stating a truth, and reflects not at all on themselves, or for that matter on their parents, who may have lived proper lives according to their light, but who certainly, after our way of thinking, have damaged their digestive and excretory organs and those of their children.

EDITORIAL.

LOCAL ANESTHETICS OTHER THAN COCAINE.

The activity of chemical research has resulted in the preparation of a number of synthetic substances which possess more or less power as local anesthetics. Some of these substances have been enthusiastically received and others have been weighed in the balance and found wanting. At the same time it must be admitted that further investigation as to the relative importance of all of them is needed, and investigation along these lines has recently been carried out by Le Brocq in the Pharmacological Laboratory of Cambridge University, England. He makes a report of the Therapeutic Committee of the British Medical Association in the *British Medical Journal* of March 27, 1909. He has studied the following drugs: Stovaine, novocaine, tropacocaine, beta-eucaine, alypin, beta-eucaine lactate, nirvanine, holocaine hydrochloride, acoine, orthoform (new), and anesthesine.

In carrying out his investigation Le Brocq considered that there were several qualities essential to a good local anesthetic, namely, a lower degree of toxicity than cocaine in proportion to local anesthetic power, sufficient solubility in water to make its use convenient, and the stability of such solutions, along with the possibility of sterilizing them by boiling without decomposing the drug. A third essential is absence of local irritant effect. The fourth is its compatibility with adrenalin, which material increases the effects of all these substances, and the fifth is the rapidity with which the anesthetic penetrates mucous membranes and the manner in which it lends itself to intraspinal injection. The speed of absorption is in many instances a matter of little importance, and under certain circumstances it is conceivable that slow absorption may be distinctly advantageous in that the chance of general systemic effects is diminished when the drug is slowly absorbed. Further, if it is slowly absorbed its local effect is apt to be greater in that it is not so rapidly removed from its field of action.

Le Brocq believes that if any drug is so insoluble that it is unable to form a two-per-cent solution, it should not be considered worthy of competing with cocaine. Holding to this belief he has excluded from the competition acoine, holocaine hydrochloride, new orthoform, anesthesine, and beta-eucaine, although the latter drug is soluble in the proportion of two per cent if the solution is warm. On the other hand, stovaine, novocaine, tropacocaine, beta-eucaine lactate, alypin, and nirvanine are freely soluble in water, their solutions are stable, and their solutions keep for some time without deterioration. All of these drugs possess the additional advantage over cocaine that boiling them does not decompose them, whereas cocaine is decomposed by boiling.

Taking cocaine as a standard local anesthetic, Le Brocq found that stovaine is more powerful than any of the other local anesthetics, weight for weight. Indeed, stovaine exceeds cocaine in its local anesthetic properties. On the other hand, alypin, beta-eucaine lactate, novocaine, and tropacocaine are about equal in power, but nirvanine is inferior to cocaine as a local anesthetic.

Taking up for consideration the question of toxicity he found that all these drugs produced death, if given in toxic dose, by paralyzing the central nervous system. In frogs, on the other hand, death is due to the failure of the heart. The relative toxicity of these various drugs in frogs and small mammals is given in the following table:

TOXICITY IN FROGS.

The minimal lethal dose for a 20-gramme frog, using a 2-per-cent solution, is for:

Alypin	6 minims	(most toxic)
Cocaine	12 "	
Stovaine	15 "	
Nirvanine	17 "	
Beta-eucaine lactate	20 "	
Tropacocaine	20 "	
Novocaine	40 "	(least toxic)

TOXICITY IN MICE.

The minimal lethal dose for a 20-gramme mouse, using a 2-per-cent solution, is for:

Alypin	4 minims.
Cocaine	5 "
Nirvanine	7 "
Stovaine	8 "
Novocaine	10 "
Tropacocaine	10 "
Beta-eucaine lactate	12 "

TOXICITY IN RABBITS.

The minimal lethal dose for a rabbit weighing 1000 grammes, using a 10-per-cent solution, is for:

Alypin	between 18 and 23 minims.
Cocaine	" 24 " 30 "
Stovaine	" 35 " 45 "
Tropacocaine	" 44 " 54 "
Novocaine	" 53 " 63 "
Beta-eucaine lactate	" 65 " 75 "

As the toxic action of these drugs is to paralyze the nervous system, and so the respiratory center, the toxicity in mammals must be regarded as the correct reading, for when respiration ceases the animal dies.

If the toxicity of cocaine be represented as 1, then

The toxicity of	Alypin	will represent	1.25
" "	Cocaine	"	1.0
" "	Nirvanine	"	0.714
" "	Stovaine	"	0.625
" "	Tropacocaine	"	0.500
" "	Novocaine	"	0.490
" "	Beta-eucaine lactate.	"	0.414

It is evident from this table that while alypin has anesthetic powers equal to cocaine it has a higher toxicity, whereas a number of other drugs have a materially lower toxicity than cocaine.

Concerning the relative irritant effect of these drugs, Le Brocq found that stovaine, beta-eucaine lactate, and tropacocaine are far more irritating than cocaine, and that novocaine is the only drug which is superior to cocaine in this respect.

All these anesthetics are compatible with adrenalin if the solutions are fresh, but if the solutions with adrenalin are kept for more than a day or two they are prone to decompose, which, however, may be to some extent arrested by keeping the solutions in well-stoppered colored bottles.

Le Brocq reaches the following conclusions in regard to novocaine, tropacocaine, beta-eucaine lactate, and stovaine:

In determining which of these four drugs is the most suitable substitute for cocaine, it is necessary to compare them with one another.

If novocaine and tropacocaine be first compared, their toxicity and anesthetic properties are, roughly, equal; but the irritant action of tropacocaine is far greater than that of novocaine; in other respects their actions are similar, therefore novocaine is a more suitable drug than tropacocaine.

On comparing novocaine with beta-eucaine lactate it is seen that while the anesthetic value is roughly about equal, the toxicity of beta-eucaine lactate is slightly less than that of novocaine, but the irritant action of beta-eucaine is far greater than that of novocaine. It appears, then, that while beta-eucaine lactate has only a slighter degree of toxicity to recommend it in preference to novocaine, its irritant action far and away overshadows any such slight advantage, and novocaine is recognized as undoubtedly the better drug of the two.

Finally, it only remains to compare novocaine with stovaine. The former drug is less toxic and much less irritant; indeed, its specific action on nerve fibers is so great that it has practically no destructive effect on the other tissues; stovaine is more toxic and considerably more irritant.

The one definite disadvantage which stovaine possesses over all the other local anesthetics is its greater injurious action on nerve fibers, as shown by anesthesia. If stovaine and novocaine be given in doses so that their anesthetic action is the same, both the irritant and toxic effect of the former drug, even in the smaller dose in which it is administered, are greater than the relatively larger doses of the latter.

Le Brocq believes, therefore, that of the drugs which have been investigated, novocaine is most satisfactory for general use. Its anesthetic action is equal to that of cocaine, and its toxicity and general destructive power on the tissues are very much less.

RATIONAL HYDROTHERAPY.

As we have frequently pointed out, there can be no doubt that all remedial measures other than drugs are greatly increasing in popularity with the profession and the public. Among the more important of these is the employment of hydrotherapy and heat

and cold in the treatment of a large number of conditions which yield more readily to these agents than to drugs. It is unfortunate that in many schools of medicine but little emphasis and instruction is given along these lines, and still more unfortunate that many practitioners have not a clear conception of the class of cases to which these measures are suitable, and are not well informed as to the contraindications to their use.

At the present time there can be no doubt that a considerable number of persons are actually damaged by the employment of heat in the treatment of many conditions from which they think they are suffering. In the great majority of these cases the patient takes it upon himself to prescribe Turkish baths or "bakings" because he has heard of some friend who has been benefited by some such plan of treatment, and we venture to assert that it is by no means a rare occurrence for a physician to be consulted by an individual whose unguided use of the Turkish bath has resulted in cardiac feebleness or vascular disorders, which are, of course, chiefly functional rather than organic. In certain patients, to whom at first glance the application of heat would prove advantageous, a more careful investigation reveals the fact that the heart is so dilated and feeble that such a plan of treatment would not only be harmful but actually dangerous.

We have seen a number of cases of this kind within a comparatively short time, and they are particularly met with in persons past middle life, who attribute their sufferings to gout or other diathetic disorder, and in men and women who attempt to reduce their "flesh" by exposure to great heat and profuse sweats, with the result that they produce circulatory weakness. As a matter of fact the first class would be more benefited by carefully graduated exercises in the fresh air, in order that impure materials might be oxidized rather than formed and then excreted by sweating. In the second class there is a failure to recognize that the laying on of a certain amount of "flesh" is as natural with advancing years as is the change in the color of the hair or as is the development of wrinkles in the face. Indeed, in a large proportion of cases a gain of weight is indicative of health rather than disease, and he or she who attempts to meddle with nature's normal processes usually meets with disaster.

A very sensible article along these lines is published in the May issue of the *Yale Medical Journal* by Dr. Peck, who points out that while at first thought it may seem a little far-fetched to speak of giving baths with scientific precision, it is nevertheless true that pronounced benefits may follow if proper attention is paid to the individual needs of the patient and care is exercised as to the exact temperature of the water and the pressure with which it is delivered, and, conversely, that great harm may result when these precautions are disregarded.

In regard to the Turkish bath there can be no doubt that a considerable number of patients can take a bath of this kind by the use of modern "electric-light cabinets" who would be damaged were they to go into the ordinary hot room of a Turkish bath establishment, and it is a well-recognized fact that patients develop a profuse sweat in the electric-light cabinet when the temperature of the air which it contains is many degrees lower than the temperature which is required in an ordinary Turkish bath to produce the same amount of sweating. As a result the patient sweats sooner and more profusely and is less oppressed and depressed when the electric-light cabinet is used than when the ordinary hot-air apparatus is employed, not because, so far as we know, an electrical influence is exercised, but because the light rays from the electric bulbs stimulate the skin and peripheral nerves and so hurry or aid the sweating process. In this connection we quote with our hearty approval the concluding passage in Dr. Peck's article:

"For those who are well and in robust health, who take Turkish baths not because they are ill but in order that they may keep from being so and for the comfort which they derive from a good sweat and the accompanying massage, I would recommend

the ordinary Turkish bath; but for the sick person, no matter what his ailment may be, whether he is suffering from chronic rheumatism, neurasthenia, general debility, or whatever complaint, I cannot too strongly recommend that he keep away from the ordinary Turkish bath establishment, and if he need some form of hydrotherapeutic treatment, take it under the direction of some one skilled in this particular line of work. In subacute and chronic rheumatism, or any form of nutritional and metabolic disturbance, where the object is to bring about an increased elimination of uric acid and other nitrogenous waste products and to relieve the kidneys of abnormal strain, the results of the experiments detailed above would seem to prove conclusively that there is no question of the choice of methods between the use of the hot-air bath and the incandescent electric-light bath.

"These conclusions seem to be well founded when one stops to consider the physical properties of the two agents. In one case the body is heated by a process of convection, successive layers of tissue being heated until the body temperature is raised one or two degrees; while on the other hand the light and heat rays, which are closely related in physical properties to sunlight rays, penetrate directly the tissues and produce their effects upon the metabolic processes by directly stimulating the normal body activities. We are coming more and more to believe that these metabolic processes are carried on through the intervention of certain enzymes or ferments, and exposing the body to the electric-light rays apparently stimulates these fermentative processes to more normal activity."

THE DIET IN GASTRIC ULCER.

For many years it has been the practice of most medical men when called upon to carry out a plan of treatment for the relief of gastric ulcer to follow the so-called starvation method, and to attempt to provide the body with food and liquid through the rectum. Although it was supposed that in many cases a certain amount of nourishment was absorbed when given by enema, investigations carried out during the last few years have proved pretty conclusively that little else than the salts and liquids of such an injection are taken up from the lower bowel, so that the patient during the time that she is deprived of food taken by the mouth really lived largely upon her own tissues. Comparatively recently Lenhartz has advocated very vigorously a plan of treatment which consists in mouth feeding, asserting among other reasons for this plan that by the adequate nourishment of the patient vitality is maintained and healing processes are therefore carried on more rapidly. As our readers know, from what we have published in the GAZETTE in the past concerning this method, Lenhartz's treatment consists in absolute rest in bed for a month and in feeding the patient with small quantities of beaten-up eggs and milk, the quantities being increased day by day. An ice-bag is kept constantly applied to the epigastrium, and after the first week soft boiled rice, minced meats, and semisolid and solid foods are gradually allowed.

In the way of drugs bismuth and iron are chiefly relied upon. Another advantage which is claimed for this method is that the food takes up the free hydrochloric acid and so prevents it from acting upon the ulcer, and the well-known fact that taking of food often relieves the pain of gastric ulcer is advanced as an argument in support of this view. The actual quantities of foods allowed by Lenhartz consist on the first day of from 7 to 10 ounces of milk with one egg, and the increase is 3½ ounces of milk each day and one egg each day until a quart of milk and six to eight eggs are ingested. The amount of meat first given is two ounces. The bowels are not disturbed by treatment during the first week, but they are not prevented from moving naturally. If they do not move naturally an enema is given every fourth day during the rest of the treatment. Although the number of calories which the patient receives during the first few days is considerably below the

number actually required for the maintenance of nutrition, the gradually increased quantities of food soon bring the calories up to 3000 per day, which is fully as large as an individual in perfect health needs to ingest.

In the *Proceedings of the Royal Society of Medicine* for March, 1909, Spriggs reports his results obtained in 77 cases of gastric ulcer, thirty-three of which were treated by the Lenhartz method and thirty-four by the more old-fashioned plan. Spriggs believes that the danger of hemorrhage in the feeding plan is apparently less than under the starvation plan. He also is certain that under the Lenhartz diet pain as a rule disappears entirely within forty-eight hours, and the weight of the patient usually is increased.

Concerning the subsequent history of the patients he believes that the Lenhartz method is not followed by relapse any more frequently than the older plan. So many clinicians have now resorted to this more humane and comfortable process of cure that it may be considered to have attained a well-recognized place among medical procedures, and we would suggest that our readers test its value in cases which come under their care.

THE VALUE OF CALCIUM CHLORIDE AND CITRIC ACID FOR THE PURPOSE OF INFLUENCING THE COAGULABILITY OF THE BLOOD.

On several occasions during the past few years we have called attention to a number of experimental researches in which results have been obtained which indicated that calcium chloride when given by the mouth, or injected subcutaneously, materially increased the coagulability of the blood, and therefore was of value for the purpose of controlling hemorrhage which could not be influenced by ordinary surgical procedures. Other studies have also been quoted which seem to indicate that the use of citric acid diminished the coagulability of the blood. Although a considerable number of investigators have worked upon this subject, Wright, of England, has published most of the important papers, having associated with him at various times Knapp, Paramore, and Ross. Physicians and surgeons in active practice have usually failed to get the results from the administration of calcium chloride which the investigations of Wright justified them in expecting.

In our experience practically no results have been obtained in the treatment of hemorrhagic states, and we therefore have read with much interest a contribution made to the *Quarterly Journal of Medicine* for January, 1909, by Addis, who carried out his investigations in the Laboratory of Physiology of the University of Edinburgh. After pointing out that Wright's investigations, if correct, are of exceeding importance, he proceeds to show that the technique which he employed was faulty, that alterations in the calcium content of the blood had little or no effect on the coagulation time, and further that citric acid seemed to be equally impotent. Addis does not deny for a moment that both of these substances are capable of altering the coagulability of the blood, but he does deny that the amount of variation in the calcium content which can be produced by their administration by the mouth is too small to produce an appreciable effect on coagulation time. Careful thought, aside from experimental investigation, would seem to support this view, since one of the remarkable functions of the body seems to be its ability to protect itself from deleterious quantities of substances which are taken into the body with the food, and if the ingestion of citric acid could lower the calcium content of the blood materially the free use of lemon juice would produce havoc and the free use of foodstuffs containing large percentages of calcium chloride might result in curious pathological states which are now unknown. Addis's conclusions, therefore, would seem to show that any attempt to influence the coagulation of blood by the use of these substances when given by the stomach is futile. Whether it is possible to influence the coagulation by subcutaneous injection would seem to be still a subject for research.

MEAT WINES.

In a recent editorial note in the THERAPEUTIC GAZETTE we called attention to the feeble therapeutic value of the old-fashioned, but somewhat popular, preparation which bears the common name of "Beef, Wine and Iron." In a recent issue of the *British Medical Journal* an editorial note deals with a somewhat cognate subject. It points out that a generation ago it was not uncommon for the practitioner of domestic medicine to prepare a tonic wine by putting a few grains of quinine into a bottle of cheap sherry. It was not long before manufacturers followed the example of the domestic practitioner, and not content with adding quinine sometimes added coca as well, and then some extract of meat. An analysis of seven so-called "meat wines," considerably used in Great Britain at the present time, showed that in each instance the percentage of alcohol equaled that commonly found in sherry or port, and the actual nutritional value because of the presence of meat extracts was exceedingly low. Not only was this true, but in one instance where a so-called tonic and nutritive wine was said to contain quinine, the quantity of this alkaloid was so small that it could not be weighed and failed to respond to so delicate a test as the formation of a fluorescent solution. It is bad enough to administer so-called meat extracts in wine with the idea that the patient is being nourished without being subjected to the delusion that drugs are being ingested which are not actually present.

THYMUS DEATH.

This topic, always of interest, since little understood, concerning a fatality which cannot be predicted or guarded against, the mechanism of which is much disputed, has again been taken up in serious discussion by DENECKE (*Deutsche Zeitschrift für Chirurgie*, May, 1909), who reports the case of a five-year-old rickety boy who since the age of two turned blue and fainted whenever he wept bitterly. These alarming phenomena were accompanied by a slowly forming tumor at the base of the neck. This first was taken for a goitre and treated with iodine. After an attack of whooping-cough the tumor grew and the venous obstruction became more marked. The fainting attacks were never preceded by dyspnea and came on quite suddenly. Examination showed nothing in the neck when the child was absolutely quiet. On the slightest exertion the external jugular became prominent. The venous congestion became pronounced on movement and was accompanied by a slight stridor. On forced respiration resistance could be felt in the jugulum. The thyroid was not enlarged nor could thymus dulness be detected. An incision was made over the cricoid cartilage and the manubrium, care being taken to avoid the enormously dilated median veins. On opening the pretracheal space the extremities of both thymus lobes were perceived extending from 1 to 2 centimeters above the upper border of the sternum. They were shelled out of the capsule and the latter was sutured to the periosteum of the sternum. Eight months later the child had no more fainting spells, although the veins still became markedly dilated on coughing and straining; they were much less so than before the operation.

Dilatation of the veins of the neck has been noted both in the young and in the old. As a rule only one vessel is affected and the condition is without symptoms. In this particular case the general dilatation spoke for mechanical obstruction at the root of the neck. This opinion was confirmed by the slight stridor which was heard only, it is true, on violent exertion.

There are a sufficient number of cases of venous obstruction from a thymus growth recorded in literature to prove the existence of this condition. Fatal edema of the brain was noted in one instance; in another, through thymus pressure upon the pulmonary artery, edema of the lung. Cohen reports a seven-months-old child, who after two days of distress, characterized by rapid but unobstructed breathing, with slight

cyanosis, died, the autopsy showing great dilatation of the aorta incident to thymus pressure; whilst Lange reports an eight-months-old child sick for eight days, cyanotic and markedly dyspneic at the time he first came under observation, exhibiting a large thymus, great hypertrophy of the heart, and marked venous congestion of all the organs. The primary hypertrophy is undoubtedly due to obstruction due to pressure, and the death to failure in compensation. Indeed, it is usual in these cases to find a markedly hypertrophied heart. Denecke considers it extraordinary that so much importance is attached to the symptoms of dyspnea as characteristic of thymus hypertrophy, when frozen sections demonstrate beyond question that the trachea is practically walled off from the thymus by the large vessels.

Flügge holds that pressure of the thymus is conveyed through the artery to the trachea or bronchus. Dwornitschenko and Rehn believe that the left innominate vein because of its oblique course between the aorta and the thymus is especially subject to the influence of pressure. It requires only a slight increase in the size of a gland, such, for instance, as would be incident to acute hyperemia, to compress the vein against the much less yielding wall of the aorta. In the case reported by Denecke the symptoms indicated that whilst both innominate veins were obstructed, this was much more marked on the left than on the right side.

Rehn speaks of thymus deaths with prodromal stenosis symptoms, and of sudden death without warning. This classification Denecke believes could be bettered by grouping the cases under those of chronic and acute pressure, holding, however, that under the first group should be included those cases which, though no symptoms are present during life, exhibit post mortem marked thymus hypertrophy, with encroachment upon the lumen of the vessels. Paltauf has stated that before it can be accepted that the thymus by its pressure upon the trachea causes death autopsies must be performed which clearly demonstrate the existence of such pressure. This proof has been afforded, Ehrhardt having reported a most convincing case. None the less it is true that in acute thymus death a convincing proof of pressure is afforded only in the exceptional cases. As a rule autopsy has shown simply venous congestion of the organs, subpleural and subpericardial hemorrhage, punctiform hemorrhage into the brain, and not always these signs, an obvious enlargement of the thymus being practically the only finding.

A number of observers regard the autopsy findings as absolute proofs of death by suffocation, whilst others attribute it to the weak heart incident to a lymphatic temperament. Rehn regards it as an open question whether death is due to heart failure incident to compression of the large vessels or to suffocation.

As to the causes of the thymus swelling, it has been observed a number of times in new-born children, the victims of hereditary syphilis. Thymus apoplexy has been recorded as the cause of death, though this remains to be proven. Thymus abscess has also resulted fatally, this lesion having been regarded as metastatic from a stomatitis in a case reported. In but one case were bacteria found in the contents of an abscess.

Venous congestion is an undoubted factor in increasing the size of the thymus, as instanced by the frequency with which obstructive symptoms develop incident to crying or effort, and in turn the congestion, at first physiological, becomes pathological, from pressure of the now enlarged thymus. It cannot be doubted that the thymus can rapidly become an obstructing factor through sudden congestion, and that this congestion may be without previous characteristic symptoms.

The thymus is normally subject to wide variations in size. Clinical records of autopsies show that symptoms may be entirely absent in large glands, while in small ones they may be pronounced. Denecke expresses his ignorance of the extent to which the thymus may be increased in volume incident to sudden hyperemia, and doubts whether a gland of normal size can ever reach a degree to cause lethal obstruction. Cross-sections of children show that

in the upper part of the chest the vessels are closely crowded together; under such circumstances it is obvious that a very slight increase in size may throw extra burden on the heart and may interfere with venous return, or may by pressure carried through the vessels obstruct the trachea.

It must be confessed that the so-called thymus death still leaves much to be explained, especially in those cases in which post-mortem examination shows no pathological alteration of the gland other than moderate hypoplasia. The theory of hyperthymization yet remains an unproven one. As to the conception of a perverted secretion, the fact remains that a persistent thymus is frequently found in adolescents who die suddenly from inadequate causes, as narcosis, or bathing, or during operation on exophthalmic goitre (79 per cent). These deaths, since they cannot be fully explained on a mechanical basis, strongly suggest that the thymus exerts a distinct effect upon the metabolism and that its persistence is accompanied by a lowered vitality. The cases of operative removal of the thymus because of obstructive symptoms, though few, are full of promise for the future, nor does the operation in itself seem especially difficult.

MODERN TREATMENT OF FRACTURES.

Under this title, which would seem to indicate a complete revolution in older methods, that brilliant and enthusiastic writer, Lucas-Championnière, delivered an address at the annual meeting of the Cardiff Medical Society, whilst at about the same time his English colleague, Arbuthnot Lane, touched with the same spirited enthusiasm, and even more gifted in his power of vivid expression of his beliefs and ideas, addressed the American Medical Association upon the Operative Treatment of Fractures.

Lucas-Championnière by the modern method of treating fractures means the treatment by movement, and states that he has made observations which give a revolutionary character to the method. He starts with the assumption that a certain amount of movement between the fragments assures the best bony repair, and on this as the corner-stone he bases his method. Moreover, mobilization gently performed as early as possible after the injury to the bones is the method which best promotes disappearance of the pain. He states that by simple mobilization, by massage, and even by his own examination, the surgeon ought never to cause pain and so produce complications. He believes that the reduction of fracture is merely a relative necessity; it should be resorted to only in certain deformations of the axis of the bone which are incompatible with the function of the limb, such as occur in the lower third of the leg or in the shaft of the humerus. In a large number of cases the maneuver of reduction is useless; it is useless in all fractures of the radius with impaction and moderate deformity; in most fractures of the upper extremity of the humerus; and in the great majority of fractures of the neck of the femur. In all fractures in which the displacement is due to muscular contraction any attempt at reduction is useless, as in fracture of the clavicle, of the olecranon, and many fractures of the malleoli.

After massage the fracture is either spontaneously reduced, as in the case of the olecranon, or is very easy to maintain reduced, as in the case of the clavicle and malleolus.

Those conditions which favor the vitality of the limb are all more important than those which produce immobilization of the fragments. The fact that shortening has not the injurious influence on repair which it is said to have should not be lost sight of when considering displacement. A moderate degree of shortening which does not change the static position of a limb is favorable to repair. The muscles surrounding a shortened lever act more rapidly and better than upon a lever on which they are stretched. A certain amount of shortening ought not to be interfered with, as it is favorable to the repair of a broken bone.

Massage has so great an effect in stimulating bony secretion at the site of fracture that in children, in whom the activity of the production of bone is great, massage ought not to be applied, save with great modera-

tion, for fear of provoking excessive osseous secretion—in fact, a tumor. In their case simple mobilization is often sufficient.

Mobilization from the beginning, within the first twenty-four or forty-eight hours, is of capital importance, and at this stage movements of very small amplitude are sufficient; passive or induced movements are the best at the beginning. Active or spontaneous movements ought to be measured and directed by the surgeon; to allow the patient to follow his own fancy with regard to active movements is dangerous—all the more dangerous because with this method the pain caused by movement disappears from the beginning, and therefore does not limit the untimely action of voluntary movement. The pain experienced and the degree of sensitiveness of the callus are the best guides in directing and in permitting movement by the patient.

The secondary treatment of fractures and their supervision ought to be prolonged. Functional use of a fractured limb is the condition most favorable to its regaining active power. Even during this secondary period everything likely to irritate the region of the callus ought to be avoided. It is useless to cause pain by movements exaggerated in amplitude or by resort to forcible manipulation.

In contrast to Lucas-Championnière's utterances, voiced with an evident sincerity, but practiced by few other than himself, Arbuthnot Lane maintains that absolute passive and complete fixation are the essentials to entire functional restoration for fracture of the bone, and with this belief probably the great majority of the world's most experienced surgeons are thoroughly in accord. To insure asepsis, an incision of ample length is made. Several folds of gauze are attached to the edges of the skin incisions by means of fenestrated forceps specially constructed for the purpose. The forceps used to control hemorrhage exert pressure upon the bleeding vessels sufficient to permanently obliterate their lumen. By their use the necessity of the introduction of the gloved hand into the wound for the purpose of tying is avoided. All instruments employed for manipulating fragments, holding swabs, plates, and screws, drilling bones, and driving in screws are also very long and very powerful in order to avoid any contact of the portion of the instrument grasped by the hand with the wound, since the gloves are liable to be damaged in the powerful manual efforts which are sometimes necessary to restore the broken bone to its original form.

To effect apposition of the spiral fracture it is necessary to divide or displace all soft parts intervening between the fragments, to carefully clean away any clot or soft tissues from the fractured surfaces, and especially from the retreating angles of the fragments, and to exert traction on the limb, supplementing that traction by forcible apposition of the fragments by powerful forceps which are so manipulated as to glide the inclined plane of one fragment upon the other. In fracture of the femur produced by direct injury, traction alone exerted on the limb does not appear to influence the overriding of the fragments. The fragments can most readily be brought into apposition by so manipulating the limb that the extremities of both fragments are made to protrude through the incision, and can be manipulated till the inner margins of the fractured surfaces are brought in contact with one another. Each fragment is grasped with forceps, and while the limb is slowly and steadily extended the opposing edges of the ends of the fragments are levered on one another till the broken surfaces come into accurate apposition, when the axes of the fragments are in continuity and the bone is restored to its normal form. The difficulty in effecting accurate apposition is very greatly increased by the presence of comminution, which can make a considerable demand on the skill and ingenuity of the surgeon.

Lane holds that operation should be undertaken as soon as the skin can be effectually cleansed. In the vast majority of cases Lane prefers to use as long and as strong a steel plate as possible, carrying as many screws as space permits. The screws are employed of a length only sufficient to en-

gage the proximal compact tissue and threaded up to the head in order to secure as firm a hold as possible on the bone. In fractures of infancy, when two or more weeks have been allowed to elapse between the receipt of the injury and the operation, the distal fragment loses its density at a very early period, and while the proximal fragment will hold the screw securely the thread will get no secure grip of the distal portion because of its friability. Under such circumstances he supplements the junction by encircling the plate and distal fragment with a loop of silver wire.

Lane's plea is mainly for absolute apposition and retention, and for a free incision and the application of buried splint when this cannot be accomplished by simpler methods. This practice is one which is received with growing favor.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF DISEASES OF THE HEART.

In an article with this title in the *British Medical Journal* of April 24, 1909, BARR says that cardiac drugs should only be used when necessary and always under strict medical supervision. Unfortunately for the public they have taken to drugging themselves with all manner of noxious tablets, and an enormous amount of mischief is caused by the indiscriminate use of cardiac tonics. The continued high arterial tension which is thus long maintained often works irreparable mischief in the aorta. It is better for a jaded horse to lighten his load than to apply the whip, so remedies which lessen the work of the heart are often more effective than cardiac tonics. When the balance between the two sides of the heart is effectively maintained, drugs are as a rule unnecessary, except to regulate the blood-pressure, and when this is high decalcifying agents and moderate cathartics answer best. When there is cardiac failure, tonics such as digitalis, squills, strophanthus, caffeine, strychnine, and the lime salts must be used, but as soon as compensation is restored their use should be discontinued. If there be any tendency to thrombosis or embolism, decalcifying agents, such as phosphoric and citric acids and their soluble salts, should be employed. In cases of cardiac thrombosis and pulmonic embolism in which the symptoms are very urgent strong ammonia should be freely used; a mixture of 5 minims each of liquor ammoniæ fortin and spiritus chloroformi in a wineglassful of barley water every hour or half-hour is an effective remedy. In mitral stenosis we not infrequently get a free hemoptysis, which in this case is the best form of bloodletting, and should not be too quickly checked.

In 1886 the author condemned the use of all astringents in such cases, and strongly advocated the employment of nitroglycerin and atropine. It is rather amusing, he asserts, to see the rediscovery of this treatment recently in the medical journals. In all spasmodic affections, such as angina pectoris, the best remedies are nitroglycerin, morphine, atropine, nitrite of amyl, iodide of ethyl, and other preparations of iodine. When the blood-pressure is very high, there are a whole host of remedies at our command in addition to those which the writer has mentioned for the treatment of spasmodic or painful affections, but the decalcifying agents, the benzoates, the hippurates, iodine, and thyroid may be especially specified.

So far as we at present know, the presence of free calcium ions in the blood and tissues is necessary for effective muscular contraction, and now that Dr. Blair Bell has given us an excellent method for estimating the free calcium in the blood there is no reason for any one being ignorant on the subject. The calcium ions increase the force of the muscular

contraction but diminish muscular irritability and (according to Loeb) inhibit the rhythmical contraction of muscle fibers, which he thinks does not depend on lessened excitability, but in some chemical combination of the calcium ions in the muscle which renders its rhythmical contraction more difficult or impossible.

The author is still of the opinion that the calcium ions lessen irritability of the heart muscle, and Blair Bell has shown that when a solution of calcium chloride was injected into the veins of a rabbit the rhythmical contractions continued, the amplitude of the contractions increased, but their frequency diminished, and when a poisonous dose was used the heart finally ceased in systole. In many febrile affections the calcium salts are readily thrown out of the blood, hence a frequently renewed supply is demanded; but unfortunately, long after the demand is satisfied the supply continues, owing to the indiscriminate use of milk in all the ills to which flesh is heir.

Nowadays milk is not confined to babes and sucklings, but has been extended to those of riper years. This inordinate supply of lime salts increases the viscosity of the blood, raises the blood-pressure, hastens the formation of scar tissue, and leads to degenerate changes in the vessels and heart. When there is an excess of calcium ions in the blood, the cardiac contractions are apt to become infrequent, slow, and effective, and owing to the greater muscularity of the left ventricle its irritability becomes less than that of the right, and the rhythmicality of the latter being greater it tends to act in advance; hence we get irregularities and intermissions. A similar inhibition is also often induced by digitalis, which seems not only to inhibit the action of the heart, but also to disturb the balance of blood-pressure in the two sides. When the pulse becomes very slow, as in Stokes-Adams's disease, it is well not only to cut off the lime salts and use decalcifying agents, but we should also use such ions as stimulate rhythmical contraction, such as sodium, chlorine, and iodine with thyroid; strychnine is also valuable.

There is no condition of the heart in which alcohol is beneficial, except in spasmodic and painful affections such as angina pectoris, and even in such cases nitroglycerin, morphine, and atropine are better and more easily regulated remedies. Alcohol is a protoplasmic poison, and under no circumstances can it strengthen the cardiac muscle. It lowers the arterial and raises the venous pressure, and increases the diastolic tension within the heart. In this way it acts as a cardiac stimulant, but as it has a paralyzing effect on the cardiac muscle there is a loss of tone with tendency to dilatation of the heart; hence the large, flabby hearts of beer drinkers, and the great retention of fluid in their vessels and tissues. Tobacco is a nervine sedative and cardiac depressant. Cases of heart disease do better without it.

CHLORETONE IN TETANUS.

Reference has already been made to an instance reported from Ann Arbor, Michigan, of tetanus developing on the twelfth day after dilatation and curetting of the uterus, with shortening of the round ligaments after Alexander's method; but some further particulars of the case and of the treatment successfully adopted will be of interest. The patient was an unmarried girl aged nineteen, subject to dysmenorrhea, and Dr. Reuben Peterson operated in a private hospital with an aseptic technique. Stiffness and soreness about the jaws appeared during the twelfth day, and double parotitis with hysteria was suspected. For two or three days the stiffness was trifling, but on the fourth acute tetanus with marked opisthotonos developed.

Dr. Peterson called in consultation Dr. W. H. Hutchings, of Detroit, who had successfully treated five cases of tetanus by chloretone, three being bad "Fourth of July accidents" from fireworks or pistol shots. Dr. Hutchings administered to Dr. Peterson's patient an enema of 60 grains of chloretone dissolved in hot olive oil. The

spasms of the jaw and back relaxed, and the patient seemed comfortable but drowsy, as though under opium. Then Dr. Peterson administered 1500 units of the antitetanic serum, the benefits of which to patients after the development of the spasms seem to him doubtful. Early next morning the spasms recurred. An enema of 60 grains of chloretone was once more administered, the dose of antitetanic serum was repeated, and the convulsions ceased altogether. The highest temperature reached was 100.2° in the rectum, the highest pulse-rate 114. After the second dose of serum and chloretone convalescence was uninterrupted.

As already stated, Dr. Peterson failed to discover the origin of the perilous complications in his case. The catgut employed for the plastic operation on the round ligaments was tested by an expert with great care and found free from germs. A minute blister had developed at the corner of one incision, which had otherwise healed well. The serum in the blister contained the staphylococcus, but the tetanus bacillus could not be isolated. Dr. Peterson notes that this is the sixth of Dr. Hutchings's cases of tetanus, serious like all the others, and that, like them, recovery followed the administration of chloretone, which is trichlor-tertiary-butyl alcohol, sometimes called acetone-chloroform. Others may be inclined to award some of the merit to the antitetanic serum.—*British Medical Journal,* April 24, 1909.

ADRENALIN IN TABETIC CRISES.

Semaine Médicale (1909, No. 2, p. 20) contains a statement to the effect that Dr. Roehmer has employed adrenalin with good results in five cases of tabetic crises. In three of these the crises were of a gastric nature, in one case a rectal crisis, and in the fifth case a laryngeal crisis with a gastric complication. The dose in the gastric crises consisted of from four to six drops of a one-per-cent adrenalin solution in 20 Cc. of water, which was administered per os. In the rectal crisis, after a previous irrigation of the rectum, from three to five drops in 20 to 40 Cc. of water was administered per rectum. These doses were given three times a day. Under the influence of this medication Roehmer observed the disappearance of pain, nausea, and vomiting in four of his five cases. This action set in after fifteen to thirty minutes and continued for several hours. After the administration of adrenalin three times a day the attack ceased entirely. In the fifth case there was also a mitigation of all the symptoms, but the person under treatment became impatient and demanded an injection of morphine, with the action of which he was familiar.

A PRACTICAL METHOD OF REVISING THE PHARMACOPOEIA.

A practical measure, looking toward the inclusion in the Pharmacopœia of unofficial remedies that stand the test of clinical experience, has been initiated by the Section on Ophthalmology of the American Medical Association. From fifty of the best-known drugs selected from "New and Non-official Remedies," fourteen were culled by the committee as having a sufficiently wide employment by ophthalmic surgeons to justify their general recognition. A list of these fourteen drugs was sent on a return postal card to each of the 935 members of the section, with instructions to mark the six drugs which seemed most useful. The replies will be tabulated, and those remedies that have received the largest number of votes will be officially recommended by the section for inclusion in the next revision of the Pharmacopœia. The fourteen remedies named are: adrenalin, alypin, argyrol, beta-eucaine hydrochloride, chloretone, collargol, dionin, euphthalmin, fibrolysin, fluorescein, holocaine hydrochloride, novocaine, protargol, and stovaine. The idea seems eminently practical, and its adoption by the other sections would furnish a mass of cumulative evidence in regard to many unofficial preparations that will be of great value from a clinical viewpoint. Moreover, it would cover so broad

an area of investigation as to place the results beyond the possibility of any charge of partiality.—*Journal of American Medical Association,* May 1, 1909.

THE TREATMENT OF COLLAPSE WITH INTRAVENOUS ADRENALIN INJECTIONS.

KOTHE, in the *Therapie der Gegenwart* for February, 1909, confirms the favorable experiences of Hoddick, Rothschild, Calmann, and Meissl in the treatment of peritonitis and severe collapse with adrenalin. He summarized the results of his experiences as follows: "Adrenalin is the most powerful restorative which we possess at present. Intravenous adrenalin injections are particularly indicated in acute dangerous disorders of the heart and respiration. It constitutes the most active remedy in the severe collapse that sometimes follows spinal anesthesia and narcosis, and is also of service in severe surgical shock. In case of hemorrhage and in peritonitis a combination with chloride of sodium infusions is recommended. Whenever patients are rendered insensible, adrenalin should be kept on hand besides other excitants, such as camphor, etc. The dose for intravenous injection is ½ to 1 Cc. of a one-per-cent solution undiluted, or diluted 20 times—that is to say, from 10 to 20 drops in 1 l. of physiological salt solution.

TREATMENT OF TUBERCULOSIS AT SEA.

The plan of sending patients suffering from pulmonary tuberculosis on a sea voyage is no new one, and some years ago was adopted more frequently than it is at the present time. The reason for this is simple: theoretically the effect of sea air should be most favorable on sufferers from tuberculosis, but hitherto the conditions of life encountered on board ship have outweighed the benefits that might be obtained if the cabin accommodation, diet, and other arrangements could be especially adapted for invalids. Dr. Hanedoes rightly draws attention to the characteristics of ocean air. It is absolutely free from dust and bacteria. The ozone it contains is probably also of therapeutic value, although, as far as we are aware, accurate and detailed observations on this point are wanting. Further—a matter of particular importance to those afflicted with pulmonary tuberculosis—a warm, equable climate with a sufficient amount of humidity can be assured. The physiological effect of sea air is also seen in its sedative action on the nervous system, and the aseptic condition of the air acts beneficially both on the air-passages and the system at large. The salt that is present in larger proportion than in inland air appears to render the expectoration less viscid without injuring the mucous lining of the air-passages.

Dr. Hanedoes also maintains that owing to its greater density the physiological effects of sea air may be compared to those obtained in a pneumatic cabinet: the respiration is slackened and rendered deeper. Full inspiration is certainly of benefit in pulmonary diseases, and he further states that the "unconscious and continually deepened respirations unfold and strengthen the lungs much more than is obtainable on shore by gymnastics and walking." In expressing this opinion, we believe that Dr. Hanedoes only states a portion of the truth. The deep respiration brought about by "gymnastics and walking" is only one of the beneficial effects produced by these measures. Probably the chief result of active exercise is to bring about autoinoculation, by means of which the protective forces of the body are brought into action, and owing to the increase of the opsonins the phagocytic power of the white corpuscles is increased. To this matter, however, we shall again refer. Other influences of sea air mentioned by Dr. Hanedoes are the general tonic action which it exerts and the increase of appetite which generally follows. "A delicious feeling of corporal and mental animation," he says, is experienced, and the desire for more food is naturally of advantage to tuberculous subjects.

Such being undoubtedly the beneficial ef-

fects of sea air, what are the drawbacks to sending patients on sea voyages? The first that suggests itself is the want of suitable accommodation on the ordinary ocean-going vessels. Although in recent years the cabins on board the large steamers have been greatly improved, nevertheless, on an ordinary voyage, there must be occasions, sometimes considerably prolonged, during which patients will be confined to their cabins, such as the continuance of inclement weather. Further, on long voyages, great variations of temperature are experienced, and the dietary is of necessity not always in accordance with the needs of invalids, although every care that is possible is usually taken in this respect in large steamers intended for passenger traffic. Finally, but not least, seasickness is a condition that must be seriously considered in advising a tuberculous invalid to take a long sea voyage.

It is obvious, then, that such objections as the above may well make the physician hesitate before recommending a patient to adopt this therapeutic measure. Dr. Hanedoes, however, makes proposals which, although not being altogether novel, yet are advanced on other plans which have been hitherto suggested. He recommends the formation of a floating sanatorium in the shape of a large sailing vessel, provided with an auxiliary screw, which would be useful in entering or leaving harbors, or in the case of calms. The ship would be especially fitted for the accommodation of invalids. Such a plan has been made before, but Dr. Hanedoes's special point is the nature of the cruise. He rightly insists that the ship would have to sail according to a fixed arrangement, whereby season, temperature, degree of moisture of the air, qualities of the harbors to be visited, and the calmness of the sea must be all taken into account. The duration of the voyage would have to be about three months, and he suggests as the most suitable district for the cruise the neighborhood of Madeira in the course of the northeast trade winds. There the desired conditions would be most closely fulfilled. The sea is calm for months and the temperature equable. What could be more enjoyable, he asks, to those fond of the sea than a voyage to Lisbon, then a cruise in the vicinity of Madeira and the Canary Islands, with occasional visits ashore, and calls at Cadiz and perhaps Havre on the homeward voyage? No far-distant destination being in view, the land could be kept in sight for a considerable time, shelter might be easily sought should unfavorable weather ensue, and fresh provisions could be constantly provided. Weariness and the constant confinement on board ship inseparable from a long ocean voyage would be avoided, whilst the maximum therapeutical effects could be produced.

The important question next arises, for what class of patients would this treatment be most applicable? For certain cases of tuberculosis of joints, when active exercise can only be indulged in to a limited extent, we believe that a voyage of the nature suggested would prove most beneficial. For young subjects with tuberculous glands, when sufficient active exercise could be obtained in the limited space available on the deck of a ship with occasional runs ashore, such a course might also be well adopted. With pulmonary tuberculosis, however, and when the patient is able to take a good deal of exercise or to perform manual labor, the question is not so simple. The results of autoinoculation produced by "graduated labor" are very encouraging, and on a ship "labor" of the required kind would be difficult to arrange and control. For individuals in the early stage of the disease, we think that treatment on land under suitable supervision is certainly preferable. The best results of active exercise and labor are, however, only obtainable in persons of fairly good physique. There are numerous patients who, from various causes, do not respond well to graduated labor; autoinoculation cannot always be satisfactorily regulated. In others bronchial catarrh is an impediment to modern sanatorium treatment. For such cases a voyage of the nature suggested by Dr. Hanedoes might well be tried, and we believe that he has per-

formed good service by putting forward his scheme, which we should like to see brought to a practical issue, provided that all the requirements mentioned above can be procured.—London *Lancet,* April 24, 1909.

A MODIFICATION OF THE CUTANEOUS TUBERCULIN REACTION.

The cutaneous tuberculin reaction for the diagnosis of tuberculosis was first introduced by von Pirquet, and the technique recommended by him was as follows: The skin, preferably of the arm, where the test was to be made, was thoroughly cleansed and a drop of a 25-per-cent solution of Koch's old tuberculin was placed on the arm; the skin was then scratched through the drop by means of a vaccinating lancet or Pirquet's raspatory. For purposes of control other scratches were made without the tuberculin having been applied. Van Pirquet subsequently thought it better to use different concentrations of the solution. After about one and a half hours a very slight redness appeared at the spot of inoculation and also at the spot of the control scratch. This was regarded as due to the slight traumatic irritation caused by the actual performance of the inoculation. This redness disappeared after an hour or two, and if a positive result followed on the site of the inoculation of tuberculin, in about three hours a reddening of the skin appeared, which increased until it reached a maximum; this usually took from twelve to twenty-four hours.

In the *Répertoire de Pharmacie* for February a description is given of Lautier's modification of the above process. A pledget of cotton-wool of the size of a pea is moistened with three drops of a solution of tuberculin and applied to the unbroken skin on the outer surface of the arm. The application is covered with gutta-percha tissue and a pad of cotton-wool, kept in position with a bandage. It is important that the skin should be intact and cleansed with alcohol and ether just before the dressing is applied. Within twenty-four hours, if the reaction is positive, the patient will complain of irritation, which increases during the ensuing twenty-four hours. The dressing is then removed, and in the case of a positive reaction redness and sometimes papules will be observed. The reaction may manifest itself within half an hour and varies in intensity as regards redness, swelling, dryness to the touch, and tenderness produced by pressure. The results of this method were controlled by ophthalmic reaction.—*Lancet,* April 24, 1909.

PHOSPHORUS COMPOUNDS AS BRAIN FOODS.

Koch, in the *Journal of the American Medical Association* of May 1, 1909, as the result of an original study of this subject reaches the following conclusions:

1. There is no evidence of any need to supply phosphorus to the brain in conditions of exhaustion, as a lack of that element has not yet been demonstrated. The actual amount lost in the exhaustion of general paralysis cannot, of course, be replaced on account of the inability of the central nervous system to regenerate.

2. The phosphorus required for the growth of the brain is amply supplied by the phosphorus of our daily diet. If desired, the addition of phosphorus-rich foods, such as eggs, sweetbreads (pancreas), liver and some meats, can be made to meet further requirements, and will far exceed in amount the phosphorus obtained in less natural form from the prescribed doses of any of the various drugs in commercial use. The use of such foods is, however, limited by their richness and their tendency, on account of their rich fat content, to interfere with gastric digestion.

3. As far as the nervous system is concerned, the addition to the diet of commercial phosphorus compounds, such as hypophosphites, glycerophosphates, phytin, lecithin, etc., is to be discouraged because, in the first place, there is no conclusive evidence that they have any effect on the growth of the brain, and secondly, the amount usually recommended means only a very insignificant addition to the amount

of phosphorus (even in its special forms such as lecithin) taken with the daily food.

[So far as clinical observation is concerned, the glycerophosphates certainly seem to be reliable agents in cases needing tonic treatment.—Ed.]

SOME USEFUL PRESCRIPTIONS IN THE PRACTICE OF GYNECOLOGY.

Bonney contributes to the *Clinical Journal* of April 2, 1909, the following therapeutic advice. He first considers drugs that act beneficially on uterine hemorrhage. He thinks ergot is the only drug in the pharmacopœia of gynecology of which the pharmaco-dynamics are accurately known, and the action of which may be termed specific. He usually gives ergot in acid solution combined with strychnine, thus:

℞ Ext. ergot. fluid., min. xxx;
Liq. strychninæ, min. v;
Acid. hydrochlor. dil., min. x;
Aquæ, q. s. f℥j.

He believes its action is more powerful when administered this way.

It is occasionally desirable to combine ergot with iron in the treatment of uterine hemorrhage complicated with anemia. The acid character of the mixture may be maintained, thus:

℞ Ext. ergot. fluid., min. xxx;
Tr. ferri perchlor., min. v;
Acid. hydrochlor. dil., min. x;
Aquæ, q. s. f℥j.

Or if a less astringent form of iron is indicated the following prescription meets the case:

℞ Ext. ergot. fluid., min. xxx;
Ferri tartras, gr. x;
Acid. tartaric, gr. x;
Aquæ, q. s. f℥j.

Strychnine may be added to either of these.

The author always gives ergot in solution if possible, but it may be administered as ergotin. Some of the solid forms are quite inert, a failing which is likely to beset any which have been kept too long. Some ergotin pills, for instance, are probably passed per anum without change. The best preparations are those made by the larger druggists.

Ergot is by far the most satisfactory of the purely gynecological drugs. Its action in stopping uterine hemorrhage is undoubted, but there are certain conditions in which its use is contraindicated. Especially so is this the case in uterine fibroids, except under unusual conditions. It has been shown that the continuous administration of ergot by producing an arterial contraction throws an increased strain on the cardiac muscle. This is the more harmful, because in these women considerable anemia is present as well. Hence one finds, as Wilson has pointed out, that old cases of "fibroids" that have been treated for years by medicinal measures exhibit cardiac dilatation, which is a serious drawback to the usually inevitable operation. Given a condition in which ergot, if prescribed, will have to be taken over a prolonged period, the use of the drug at all is contraindicated. There is only one proper treatment for uterine myomata—their removal, which should be carried out immediately they begin to give rise to symptoms. So much has the surgery of these tumors been improved that in competent hands and in early cases the risks of the operation are less than those of the removal of a chronically inflamed appendix.

There is another class of patients in whom the use of ergot is contraindicated, namely, in cases of incomplete abortion with a view to the expulsion of the retained fragments. It is true that it is not infrequently successful, but in the cases in which it fails—and they are the majority—it is responsible for much loss of time and the consequent increased risk of septic infection. The proper treatment for these cases is exploration of the uterus under an anesthetic.

As a general rule ergot is likely to be successful in uterine hemorrhage, when the consistency of the organ is soft, whereas in cases in which it feels hard and firm not much is to be expected. There is one conspicuous example of this in the condition known as chronic fibrotic metritis.

Here, as the result of a chronic inflammatory process, the musculature becomes degenerate and there is a diffuse overgrowth of fibrous tissue, involving, in advanced cases, the whole thickness of the uterine wall. These cases present exceptionally severe menstrual hemorrhage, which ergot entirely fails to control; the correct treatment is, therefore, hysterectomy.

Ergot, when used to lessen menstrual bleeding, should be given intermittently, beginning about two days before the onset of the period and continuing its exhibition so long as loss is going on, and for from two to seven days afterward. In cases of subinvolution after labor and abortion, on the other hand, it should be taken continuously for several weeks, and the same rule applies to the convalescence after curettage or the removal of polyps and other conditions in which it has been necessary to forcibly dilate the cavity of a soft and bleeding uterus.

Before leaving ergot the author says a few words on an aspect of its use which has made it the most fatal drug in the whole materia medica. He refers to its administration in cases of genital hemorrhage without the precaution having previously been taken of making a digital examination to discover the cause. It is surprising what a number of cases of inoperable carcinoma of the cervix come before a gynecologist with the history that though they had been treated with ergot for several months for the hemorrhage of which they complained, no internal examination had even been suggested. The bleeding in these neglected cases is usually attributed to the "change of life." No more fatal mistake can be made than to suppose that the climacteric is normally associated with unusual loss of blood. It is not so. At that period more than any other an immediate examination as to the cause of any irregular hemorrhage should be insisted on, and if refused the practitioner should decline to treat the case.

There are many other drugs which have been used either to replace ergot or assist its hemostatic action.

Of these the author first mentions hydrastis and hamamelis, which he usually uses in combination, thus:

℞ Ext. hamamelidis fluid., min. xv;
Ext. hydrastis fluid., min. xv;
Liq. strychninæ, min. v;
Acid. hydrochlor. dil., min. x;
Aquæ, q. s. ad f℥j.

Or with the addition of ergot, thus:

℞ Ext. ergot. fluid., min. xx;
Ext. hydrastis liq., min. x;
Ext. hamamelidis liq., min. x;
Liq. strychninæ, min. v;
Acid. hydrochlor. dil., min. x;
Aquæ, q. s. ad f℥j.

It is the author's opinion that these drugs certainly succeed sometimes where ergot fails, and they do not cause the uterine contraction pain which ergot not infrequently produces when taken to check menstrual hemorrhage. This pain or "stomach-ache," to use the women's expression, is sometimes so severe that he has known patients to refuse to take the latter drug.

Hydrastinine.—The active principle of hydrastis Bonney has used in one or other of the useful tablet combinations with ergotin and other drugs, and with satisfactory results.

Cannabin Tannate.—Of this derivative of cannabis indica his experience is limited to the tablet preparations of this drug. It may be given in doses up to four grains for menorrhagia.

Styptol and Stypticine.—Of these two drugs, the phthalate and hydrochloride of cotarnin respectively, the author speaks favorably. He has had most experience with the former, which he has used a good deal as an alternative to ergot in certain cases. The dose of either is half a grain. Styptol undoubtedly controls certain anomalous forms of uterine hemorrhage, over which ergot has no effect. Beyond this it has the power of alleviating certain forms of pelvic pain, chiefly those of menstrual incidence associated with an abnormal amount of loss. He prescribes it thus:

℞ Tablet styptol (Knoll), mitte, tab. xxx.
One tablet to be taken three times a day after meals.

From the point of view of hospital prac-

tice it has the disadvantage of being very expensive. At Chelsea it was given in powder form for a while, but it tends to decompose if prescribed in this manner.

Bryony.—This drug is largely used by homeopathists. It is supposed to check menstrual hemorrhage, but is very little known in regular therapy. The author has found it a distinctly useful drug, not so much from the point of view of hemostasis, but because in combination with aletris and other drugs it has a sedative action in certain varieties of pelvic pain. He has used it also in combination with ergot, hydrastis, and other hemostatic drugs.

℞ Tr. byroniæ, min. x;
Potassii bromidi, gr. xx;
Inf. cinchonæ, q. s. ad f℥j.
T. d. s.; or

℞ Tr. byroniæ, min. x;
Tr. hyoscyami, min. xxv;
Ext. viburni prunifolium fluid., min. xxx;
Aquæ camphoræ, q. s. ad f℥j.

These represent two such prescriptions which have been used with occasional success.

Gossypium.—This drug, obtained from the cotton plant, was much used by the American slaves to produce abortion. It is supposed to have an action somewhat akin to ergot. The author has prescribed it in certain cases of uterine hemorrhage.

The coal-tar products are often useful to relieve pain, but they often act well and then cease to do any good at all. The reason of this is not known, but in its event the substitution of another member of the series usually again relieves the pain for a while. Permanent relief of virginal dysmenorrhea by means of these analgesic drugs never occurs, dilatation of the cervix by the fetal head or the mechanical dilator being the surest cure.

The analgesic drugs are of much less service in the acquired forms of dysmenorrhea, and in chronic pelvic pain not of menstrual origin they are outside the therapeutical picture altogether.

In virginal dysmenorrhea we have merely pain, and pain for a short period, to treat in most instances. In the acquired or so-called "congestive" dysmenorrheas and in the varieties of chronic pelvic pain this is not so, there being almost invariably some other complaint as well, such as menorrhagia, leucorrhea, dyspareunia, a general sense of debility, and so on. Thus our prescriptions in such cases usually consist of several drugs administered to these various ends.

First and foremost amongst the therapeutic agents used in these classes of patients are the *bromides*. And here the author draws attention to a peculiar therapeutic observation. One of the chief complaints of the women attending a gynecological clinic is "weakness." If a male patient complained thus we should in the absence of contraindicatory physical signs give him a mixture containing, say, strychnine, dilute acid, and a bitter, and in nine cases out of ten benefit would result.

But the author has found that if we treat a case of gynecological debility on these lines the result is invariably disappointing, the patient being either no better or distinctly worse. On the other hand, the administration of potassium bromide is constantly followed by the satisfactory declaration on the part of the patient that "she feels so much stronger." He has therefore quite given up the use of the regular tonics in these cases, and uses the bromides instead.

If one may speculate on the reason of this apparent anomaly, he would say that the cause of the "weakness" complained of in the case of the male patient is in most cases primarily physical, with a secondary nervous want of tone, whilst in the case of the woman the sense of ill-being is, in the first instance, due to a hyperirritability of the nervous system, the steadying of which by the bromides immediately produces a sense of "feeling stronger."

How far this reversed action of strychnine and the bromides is applicable to women suffering from complaints other than those of the genital organs he does not know, but in gynecological practice he has no doubt of the truth of the observation which he has brought to our notice.

Perhaps the most generally useful prescription in the Chelsea Pharmacopœia is the mistura potassii bromidi cum cinchona.

℞ Potassii bromidi, gr. xx;
Tr. cinchona co., min. xxx;
Aquæ chloroformi, q. s. ad f℥j.

This is the first choice of the author in all cases of indefinite pelvic pain uncomplicated by other symptoms, and usually gives more or less satisfaction.

It is his opinion that the bromides are too often given in insufficient doses. Less than 20 grains is rarely indicated in these patients. He frequently uses the sodium or ammonium salt in cases in which a general depressant effect is not desirable.

There are two chief combinations with the bromides, viz., *ergot* and *iron*, thus:

℞ Ext. ergot. fluid., min. xxv;
Potassii bromidi, gr. xx;
Aquæ chloroformi, q. s. ad f℥j.

And—

Ferri et ammon. cit., gr. x;
Potassii bromidi, gr. xx;
Aquæ chloroformi, q. s. ad f℥j.

The first is useful in the acquired dysmenorrheas complicated by a degree of menorrhagia; the second is good in debilitated anemics complaining of chronic pelvic pain with few or no physical signs.

Guaiacum has been warmly recommended by Herman. Bonney gave it a good trial in consequence, but he cannot say he got very good results.

Aletris sometimes does good:

℞ Ext. aletris fluid., min. xv;
Tr. byroniæ, min. x;
Potassii bromidi, gr. xx;
Aquæ, q. s. ad f℥j.

This has proved very successful. Parke, Davis & Co. also prepare an "elixir" containing it. The writer commends this prescription to our notice as really useful.

Viburnum Prunifolium.—Here, again, we have a useful drug. The author usually prescribes it in the form of "liquor sedans" (Parke, Davis & Co.), dose f℥ss to f℥j, but as to the liquid extract it may be conjoined in drachm doses with any other of the so-called uterine sedatives.

Salix Nigra.—This drug, as the fluid extract in doses of f℥ss to f℥j, has been recommended in pelvic pain. Bonney has used it, and, he thinks, occasionally with advantage.

"Styptol," "Stypticine."—He has already referred to the pain-quieting effect that these drugs sometimes produce.

Belladonna and Hyoscyamus.—These two drugs are both occasionally useful adjuvants to the other agents used for allaying pelvic pain. Hyoscyamus is the more valuable of the two and is chiefly effective, the author has found, in dysmenorrhea of the spasmodic or intermittent variety. It deserves a trial in such cases.

Of the drugs useful in amenorrhea due to chlorosis or genital insufficiency, iron, of course, is the first remedy. After trying all forms in cases of chlorosis, Bonney finds the following the most useful, in that, except in cases complicated by very severe gastritis, it can be administered without fear of incommoding the stomach:

℞ Ferri et ammonii citratis, gr. x;
Liq. strychninæ, min. v;
Aquæ chloroformi, q. s. ad f℥j.

In many cases it is advisable to spend a week in administering the common white mixture:

℞ Magnesii sulph., ℥j;
Magnesii carb., gr. x;
Aquæ menth. pip., q. s. ad f℥j.

Three times a day.

When dyspepsia complicates the case to a marked degree the author gives, in addition to a strong purge at night, the following:

℞ Bismuth carbonatis, gr. x;
Sodii bicarbonatis, gr. xxx;
Spirit. chloroformi, min. xv;
Aquæ carui, q. s. ad f℥j.

Three times a day after meals when the pain begins.

For many cases of amenorrhea, whether due to definite anemia or some insufficiency of the sexual organs, the old pill of aloes and iron three times a day is difficult to beat.

Apiol, hellebore, and *savin* are supposed to have a specific emmenagogue effect. The author has used them all, but chiefly apiol, which he thinks in certain cases is efficient.

Of hellebore and savin (both given as

the tinctures in doses of f℥ss) his experience is limited to their application to those curious cases of sudden, apparently causeless amenorrhea in vigorous young women. He cannot say that he has had any definite results, but such cases are notoriously hard to treat.

Whilst on this subject the author may be perhaps permitted to mention what he considers to be the most generally useful purgative in women's diseases; it is:

℞ Ext. cascara sag. fluid., f℥j;
Magnesii sulph., ℥j;
Tr. hyoscyami, f℥ss;
Aquæ menth. pip., q. s. ad f℥j.

It is a surprisingly powerful purgative, much more so than one would gather from the ingredients, though individually active and given in full doses.

It can be prescribed in doses varying from a drachm to an ounce, and the patient should be instructed to regulate the amount herself. Its one drawback is that it is rather nasty to the taste.

Of the drugs relieving bladder irritability Bonney has this to say:

The subject of the complaints made by women on the score of the vesical function is very complex. Such complaints generally take the form of much pain during or after the act, together with a frequent desire to micturate.

In spite of the formidable list of symptoms vouchsafed by the patient, in nine cases out of ten no organic defect can be found, and that this is not due to any gross carelessness on the part of the examiner it may be noted that they disappear as mysteriously as they came on.

The author gives two prescriptions that he finds of great use in these cases. They are:

℞ Ammonii benzoatis, gr. xv;
Tr. hyoscyami, min. xxx;
Infusio scoparii, q. s. ad f℥j.

℞ Potassii citratis, gr. xxx;
Potassii bicarbonatis, gr. xv;
Tr. hyoscyami, min. xxx;
Infusio buchu, q. s. ad f℥j.

Finally, he tells us of certain topical applications and douches that have proved useful in his hands.

In cases of vaginitis a 10-per-cent solution of protargol repeatedly applied through a speculum to the vaginal wall is, he believes, the most efficient means of allaying the inflammation.

Later on in acute cases, and at once in chronic cases, it is necessary to make direct application to the cervical canal, since this is invariably infected as well, and keeps reinfecting the vagina so long as it continues. This is best done by means of wool soaked in "iodized phenol" (iodine one part, carbolic acid four parts), or pure carbolic acid, and mounted on a Playfair probe, or better still, a long and narrow-bladed sinus forceps.

Various medicaments are sometimes applied to the cervix by the vehicle of wool tampons soaked in glycerin. This is a messy way of doing it, and latterly the introduction of soluble vaginal pessaries has improved this form of therapy. They should be introduced over night and douched out in the morning.

Douches.—For purely antiseptic purposes, in simple cases, boric acid (℥j ad Oj) is probably the best. Where stronger effects are required lysol is very useful (℥ss ad Oj). Mercury solutions, even when dilute, frequently produce irritation after some time, and occasionally symptoms of mercurialism.

If a deodorant is required, tincture of iodine (℥j ad Oj) is very good for cases presenting much fetor, as in advanced cancer of the cervix.

For sedative purposes borax (℥j ad Oj) and lead acetate (℥j ad Oj) are excellent.

In the later stages of cervical erosion with much discharge, and in some forms of chronic vaginitis, more astringent douches are prescribed. Of these the author selects the following as the most successful: alum (℥j ad Oj), tannic acid (℥j ad Oj), and the injectio quercus co. of the Chelsea Pharmacopœia, which runs thus:

℞ Alum or sulphate of zinc, ℥ss;
Concentrated solution of oak bark, f℥ss;
Aquæ, q. s. ad Oj.

RESULTS OF TREATMENT OF DELIRIUM TREMENS.

To the *Journal of the American Medical Association* of April 17, 1909, RANSOM reports his results in treating five hundred cases of delirium tremens. Chloral, morphine, and scopolamine were used. All of these, the author states, increased the mortality of the delirious patients, except morphine, and its effect was practically negative. A drug which has, however, produced a marked decrease in the mortality is ergot. It was usually given in the form of the fluid extract, in drachm doses, repeated every four hours, and often in combination with whisky. In those cases in which ergot was used the mortality was only 30 per cent, while among those patients treated without ergot it was 51.6 per cent. This is a reduction of 21.6 per cent in the mortality. This result is striking when considered with reference to the uselessness of other drugs. Ergot is likewise of value in the incipient cases, the percentage of patients developing delirium being reduced 23.3 per cent by its use.

The importance of ergot in the treatment of these patients may justify a little digression from the strictly statistical line of argument. Its use in the Cook County Hospital in the treatment of delirium tremens dates from the spring of 1907, and so favorable have been the results that it is now generally employed for that purpose by the resident staff of the institution. The beneficial results of its administration have seemed to the writer to be clearly demonstrated in those cases which have been under his care. It seems not so much to shorten the attack as to render the delirium much quieter, thus preventing death from exhaustion before the natural crisis arrives. Any attempt to explain its influence would be pure speculation. It is possible that it may act by decreasing the cerebral hyperemia. By equalizing the circulation it may tend to prevent the edema of the brain and meninges, "wet brain," so frequently seen at autopsies on cases of delirium tremens.

Stomachics were used extensively, but were not taken into account in these statistics.

Stimulants were used very little, alcohol alone being consistently used. Other stimulants were used only when the patient was in a moribund condition. It would be interesting to know what would be the effect of a systemic use of digitalis, caffeine, and strychnine throughout the course of the disease, but the series of cases under discussion does not furnish the necessary data.

It is obvious from the writer's experience that drugs are not of such value in the treatment of these patients that other therapeutic measures can be neglected. This is especially true of the wildly delirious patients, for whom much more can be done by nursing than by drugs. But no more can be done than to emphasize the importance of proper methods of restraint, frequent administration of liquids, and the use of sedative baths.

In the incipient cases much can be done with drugs. Large doses of the sedatives should be given, especially chloral and bromides, and these should be repeated every four hours and kept up for several days after all signs of the disease have disappeared. Whisky should be given regularly. Ergot is also of value and may be given as the fluid extract, or in cases complicated with gastritis the aseptic ergot may be given hypodermically. In the hospital, drachm doses of the fluid extract were given every four hours for a week and more without any bad effects. If a standardized preparation of the fluid extract were used, smaller doses would probably be equally effective. Stomachics are often indicated, especially capsicum. Stimulants, aside from alcohol, are unnecessary except in cases showing cardiac incompetence.

In the cases with delirium care must be taken not to overdose the patients. Sedatives may be used with care, not more than 30 grains of chloral or its equivalent in other sedatives being given in twenty-four hours. Scopolamine is dangerous and whisky useless. Ergot seems to have been of the greatest value and certainly deserves

an extended trial. It is a question whether stimulants should be given to all delirious patients, but when there are signs of failing heart action, of developing "serous meningitis," or when the patient is passing from delirium to stupor and coma, heart stimulants should be given hypodermically.

AURAL VERTIGO.

In concluding an article on this subject in the *British Medical Journal* of April 10, 1909, SIMON says that as regards treatment, this naturally has reference to the underlying aural affection, and in giving a prognosis one has to take into consideration the possibility of the amelioration of this condition, and also the period of association of the deafness and vertigo. In non-suppurative affections of the middle ear in which the vertigo has shown itself much later than the deafness or tinnitus, it has seemed to the author that the treatment of the aural condition was more likely to lead to its improvement or disappearance. In treating the symptom itself the drug of most efficacy is quinine. Charcot instituted this treatment on the principle that it gradually destroyed the hearing, when, as it has been seen, the vertigo disappears. On the other hand, Urban Pritchard reports a case of severe vertigo from a poisonous dose of quinine. It is, however, not necessary to give it in such large doses. Given a grain at a time, it seems to reduce the irritation of the vestibular nerve, probably by overcoming congestive changes.

On the ground that vertigo is due to anemia of the labyrinth—which, however, is probably not as a rule well founded—Lermoyez suggested the use of amyl nitrite. We are all aware, of course, that in conditions of severe anemia vertigo is common, but whether this is an aural phenomenon or not, even when associated, as it often is, with tinnitus, is a doubtful point. At the same time it is quite probable that the actual cause of vertigo is not so much either congestion or anemia as the alteration in the pressure of the endolymph which may be brought about by either of these states. The bromides and iodides are sometimes useful, and pilocarpine, especially in patients in whom the aural condition is dependent on congenital or tertiary acquired syphilis, has sometimes seemed of value. Repeated lumbar puncture has been used with some, though probably only with temporary, benefit. Patients should be advised to eschew alcohol, tea, coffee, and tobacco, to avoid as far as possible mental excitement and loud noises, and to keep the bowels acting well. During a severe attack the recumbent posture should be enjoined, with ice to the side of the head. When all other measures fail, and when life is made practically intolerable, the advisability of destroying the labyrinth—at any rate the static portion of it—should be entertained. The author now refers to cases of non-suppurative ear diseases. This has been carried out in England by Milligan, Lake, and Yearsley; or, as Ballance suggests may yet be possible, the vestibular nerve, as distinct from the auditory nerve, may be divided before it enters the internal auditory meatus.

INTRASPINAL INJECTIONS OF MAGNESIUM SULPHATE IN CHOREA.

MARINESCO *(La Semaine Médicale,* Nov. 18, 1908) has treated four cases of Sydenham's chorea by the above method, and describes the results obtained in these cases. The solution he employed for the injections was a 25-per-cent strength of crystallized sulphate of magnesium, which was prepared a short time before being used, and generally speaking he withdrew first a quantity of cerebrospinal fluid equal to the quantity of sulphate of magnesium solution which he injected. The first case was a girl of fourteen, who had suffered from chronic symptoms for a short time only before admission to hospital on June 2, 1908. At first limited to the left side, the movements soon spread and became generalized. On July 5, 3½ cubic centimeters of the magnesium sulphate solution was injected into the spinal canal, and three-quarters of an hour later the intensity of

the choreiform movements had greatly diminished. The following day the movements returned in the legs, and as they did not diminish another intraspinal injection (3 cubic centimeters) was given on July 30. A half-hour later the patient complained of headache and formication in the limbs and back. The choreic movements had, however, diminished, although movements in the arms persisted. The next day the movements were reduced to a minimum, and by August 2 they had completely disappeared.

The second patient was a girl of twenty-two, who had already suffered twice previously from chorea. Following the injection her pulse-rate, which previously had been 104 per minute, fell to 68, and one and a half hours later she became numb in the lower extremities and could not move them, and they no longer showed choreic movements. A few hours later the patient slept, and it was then seen that her respiration-rate was 34 and her pulse-rate 106 to the minute; her temperature was slightly raised. Three days later the numbness had disappeared, as had also the choreic movements.

The third case was a girl of fifteen, who for about two months had had choreic movements, and on admission to hospital on August 13, 1908, these were seen to be very severe and generalized. The next day 3 cubic centimeters of magnesium sulphate solution was injected into the spinal canal, following which there was a slight increase in pulse-rate and increased agitation of the patient; the legs appeared numb, and she could not move them; the choreic movements had diminished. Four days later the patient became somnolent, and the choreic movements were still less, but she complained of headache and nausea, which continued until August 20. At this date the choreic movements were considerably less, and the patient could use her hands to feed herself, and could walk and write. On August 26 choreic movements were noticed in the arms and face, and on this day a fresh injection was given, preceded by a subcutaneous injection of morphine. One hour later the choreic movements had become less marked, but the patient complained of headache and numbness in the limbs. The following day the choreic movements were still less manifest, but as movements of the right arm and face did not cease, another injection was given on September 13. Fifteen minutes later the pulse quickened, the patient felt nauseated, complained of headache and vertigo, and the temperature rose slightly. The following day the choreic movements were much less marked and became less and less, and by September 18 had altogether ceased.

The author points out that these cases show that intraspinal injections of sulphate of magnesium exercise a remarkable sedative effect on choreic movements, and that by this treatment the disease completely disappears after a few days, and that these results are superior to those obtained by any other method of treatment. This method of treatment is, however, not without drawbacks; thus, Meltzer and Auer have found respiratory troubles occur, and others have noted motor and sensory disturbances, and sometimes urinary troubles. Some of the ill effects following the injections appear to be due to the toxicity of salts of magnesium, but it is also possible that they are due to impurities in the salt employed. The author has found that subcutaneous morphine injections have diminished the headache and pains following intraspinal injections, and he has never seen urinary troubles follow in young subjects. He is convinced that this method of treatment constitutes an excellent therapeutic measure in Sydenham's chorea, and may be employed in both mild and severe cases. —*British Medical Journal,* April 10, 1909.

NICOTINE AND TOBACCO.

At one time doubt was thrown upon the assumption that the characteristic effects of smoking were produced by the nicotine of the tobacco, but it seems now to be fairly well established that the nicotine is at any rate by far the most important constituent of tobacco smoke from the med-

ical point of view, and it has therefore seemed worth while to analyze various smoking tobaccos, cigars, and cigarettes in common use in order to ascertain the percentage of nicotine in each. Speaking quite generally, it will be found that the judgment of a smoker as to whether the tobacco, cigar, or cigarette was mild or strong agrees very closely with the results of analysis; the agreement in the case of pipe-tobacco is, in fact, absolute. In the case of cigars, one called mild contained an appreciably larger proportion of nicotine than another called strongest; but a third, also called mild, contained the smallest proportion of nicotine found in any tobacco examined except a German patent "non-nicotinic" cigar, which contained little more than half the ordinary quantity in a mild Havana.

The results of analyses of cigarettes are a little surprising, inasmuch as a Virginian of good quality proved to contain nearly twice as much nicotine as an Egyptian, and a common Virginian cigarette sold at five a penny, though it yielded less nicotine than a superior Virginian, contained a good deal more than either the Turkish or Egyptian cigarette.

In comparing the effects of smoking pipes, cigars, and cigarettes, however, other factors besides the amount of nicotine present must be taken into consideration. When a pipe, cigar, or cigarette is first started, the smoke undergoes filtration in passing through the unburnt portion of the tobacco, and, in the case of a pipe, through the stem; as smoking proceeds, the percentage of nicotine in the shortening end of the cigar or cigarette must be much increased, and when a holder is not used this portion is in contact with the lips, and it is likely that some nicotine is absorbed directly in this way; whereas, with a pipe, filtration through the stem may, perhaps, become more efficient as smoking proceeds, as the smoke has to pass through a larger quantity of moisture, but it is not possible to say how far this advantage may be counterbalanced by the presence of an accumulation of nicotine from previous smoking of the same pipe. While habits, no doubt, vary as to the point at which a cigar or cigarette end is thrown away, it is probably safe to assume that the end of a cigarette is usually a much larger proportion of the whole than is the end of a cigar, or of a pipe. The rate of smoking, too, is liable to vary, and it will probably be found that habitual and heavy smokers are considerably slower smokers than those who use tobacco less frequently.

The weights of the cigars analyzed varied from 60 to 100 grains; the five-a-penny cigarettes weighed 15 grains each, and the others about 21 grains each (without the paper); an average-sized briar pipe, filled with an ordinary smoking mixture, was found to hold about 75 grains. Observations on the time taken in the different forms of smoking showed that the same individual—a regular moderate smoker—took about fifty minutes for an average full-sized cigar, fifty minutes for a pipe, and twelve minutes for an ordinary cigarette. Taking the mild cigars, the mild tobacco, and the Egyptian cigarettes, and supposing four of the latter to be smoked in fifty minutes, the amounts of nicotine would be: Cigars, 0.9 grain; pipe, 1.1 grains; cigarettes, 0.9 grain. But, as already pointed out, it by no means follows that the amounts taken into the system would be in the same ratio as these numbers.—*British Medical Journal,* April 10, 1909.

VASODILATORS IN HIGH BLOOD-PRESSURE.

MATTHEW in the *Quarterly Journal of Medicine* for April, 1909, contributes an interesting article on this subject. From his observations he draws certain conclusions as to the individual and relative action of nitrites and organic nitrates.

1. Action of nitrites generally:

(*a*) Nitroglycerin or liquor trinitrini, sodium nitrite, potassium nitrite, erythrol tetranitrate, and mannitol hexanitrate are all powerful vasodilators. With cobaltonitrite of potassium the author did not find a vasodilator action.

(*b*) Their action can be definitely ascer-

tained as regards the time of initiation, amount of fall produced, and length of time the action lasts.

(*c*) These nitrites produce a fall in pressure only in certain cases of hypertension. In others they produce no action.

2. Comparative action of the various nitrites. These nitrites are all powerful vasodilators in suitable cases, but well-defined differences exist among them.

(*a*) Time in which the pressure begins to fall. The order of their action is the order in which the author has described them: (i) Nitroglycerin or liquor trinitrini—1 minute. (ii) Sodium and potassium nitrites—5 minutes. (iii) Erythrol nitrate—about 5½ minutes. (iv) Mannitol nitrate—about 12 minutes.

(b) Amount of fall in pressure in millimeters of mercury. The average amounts were: (i) Liquor trinitrini—28 mm. (ii) Sodium and potassium nitrites—32 mm. (iii) Erythrol nitrate—35 mm. (iv) Mannitol nitrate—35 mm.

Between the least and the greatest there is only a difference of 6 mm.—a figure that might be reduced over more extensive observations.

(*c*) Time in which the maximum fall is reached. In the four nitrites the average time was: (i) Liquor trinitrini—4½ minutes. (ii) Sodium and potassium nitrites—14 minutes. (iii) Erythrol tetranitrate—22 minutes. (iv) Mannitol hexanitrate—about 100 minutes.

These nitrites begin to act in 1, 5, 5½, and 10 minutes respectively; the maximum therefore is produced in 3½, 9, 16½, and 90 minutes after the vasodilator action begins. The amount of fall produced by each is about the same, and therefore with liquor trinitrini there is a very sudden and prompt action, not so sudden in the cases of sodium and potassium nitrites, more prolonged with erythrol nitrate, and lastly, a very gradual and slow action with mannitol nitrate.

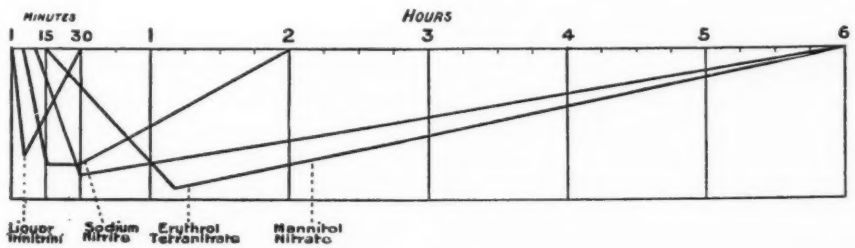
(*d*) The rise in pressure after the fall. Variation in action between the different nitrites becomes still more evident when one studies the rise in pressure toward its original level.

1. With liquor trinitrini the pressure begins again to rise almost immediately a maximum fall has been reached. The rise is slower than the fall, but in all cases the effect of the drug has completely passed off in thirty minutes.

2. Sodium and potassium nitrites have a more extended action. A maximum fall is reached in about ten minutes after the initial action has set in. This is maintained for from forty to fifty minutes. The rise then is slow, and the effect does not pass off until two hours have passed after the administration.

3. Erythrol and mannitol behave alike as regards length of action. The maximum effect is maintained for between one and two hours. The rise is very gradual, and the original level is reached only after five or six hours from the time of administration.

The various points determined for these nitrites in these observations may be seen from the following diagram (after Bradbury):



In his observations with all the nitrites the author found that in certain cases they produced little or no vasodilator action. In some a reduction was obtained of from 5 to 10 millimeters in the usual time for the particular nitrite. In others no reduction was obtained after observation over the

usual time of action. A rise in blood-pressure occurs in certain well-defined clinical conditions. In chronic inflammatory Bright's disease and in chronic Bright's disease the pressure is markedly raised, the rise being progressive. In generalized arteriosclerosis a progressive increase in blood-pressure is usually found.

These clinical conditions in their earlier stages the author invariably found responded to the nitrites, as he has indicated, but ultimately a stage is reached, seen most particularly in advanced chronic Bright's disease, when the nitrites produce little or no response. The reasons for this, the author states, he may discuss in a future paper.

In heart and kidney cases, too, in which the blood-pressure is raised, and in which in addition marked edema is present, nitrites do not act well. After the edema has disappeared the usual vasodilator action may reappear.

Dosage of the Therapeutic Nitrites.—It has to be recognized that in all cases, though within limits, high pressure is not necessarily harmful to the individual, and the idea that it has always to be attacked by every means in our power in order to obtain again a normal level has just sufficient truth to be a serious misconception. In individuals in whom it is found, it is to be looked on primarily as a compensatory change. Just as a left ventricle in aortic incompetence has to hypertrophy to accommodate itself to the altered conditions due to the aortic leak, so probably high blood-pressure must be considered compensatory if the proper relationship is to be maintained between the various parts of the circulation and between the circulation and the tissues. Undoubtedly we find, in every case that is followed for some time, that once started the tendency is for the blood-pressure to increase progressively, and our aim is to prevent this increase being too sudden and exaggerated. That too great a reduction may be harmful the author has indicated in a detailed case with erythrol, in which unpleasant symptoms were induced by too large a reduction. They set in too at a point in the pressure too high for a normal standard, but too low for the particular individual's vascular economy.

From the observations the author has detailed and many others, he made an attempt to ascertain what reduction of pressure is both necessary and safe for relieving and alleviating symptoms and in maintaining the pressure at a level that shall be least innocuous to the patient. He made observation in many cases with hypertension when symptoms had developed, such as pain, headache, giddiness, epistaxis, conditions of stomach, etc., that could be traced to the elevated pressure.

From his observations with nitrites in varying doses he invariably found that such symptoms were alleviated or disappeared altogether with a reduction of pressure amounting to about 30 millimeters of mercury, and if this fall could be maintained the symptoms did not reappear and the individual's general condition improved. He then made observations with the active nitrites in varying amounts to ascertain the quantity of each that would produce as nearly as possible such a reduction. It was after and on account of these investigations that he adopted the doses employed in the foregoing observations with the various nitrites.

1. Liquor trinitrini. Where a single dose—to be repeated if necessary in half an hour—is prescribed, the author recommends 2 minims as one most likely to obtain the desired effect.

2. Sodium and potassium nitrites. In suitable nitrite cases 2 grains produces a reduction of just over 30 millimeters of mercury. This action will last two hours, and only after this is it necessary to repeat it. No benefit is obtained by increasing the dose, and a less dose will not give the desired effect.

3. Erythrol nitrate. With this drug a dose of ½ to 1 grain will produce the beneficial reduction, and the effect will last about six hours. Owing to individual susceptibility to erythrol, and in some cases having obtained sufficient reduction with the smaller dose, the author would recom-

mend that it be used in all cases to start with.

4. Mannitol nitrate. The author has used only tablets of 1 grain. These produce the necessary reduction of pressure and effects.

With it he has not observed the same individual susceptibility or any tendency to unpleasant effects, probably owing to the fact that it produces its maximum effect much more slowly than erythrol.

The author points out that in all cases the useful and suitable dose of a nitrite for each individual can readily be ascertained by making an observation or two and noting the effect of the nitrite as to the amount of fall produced and time the action lasts.

RHEUMATIC FEVER AND VALVULAR DISEASE.

To the London *Lancet* of May 8, 1909, MOORE contributes a paper on this topic. He reminds us that the treatment of rheumatic fever proposed by Sydenham was based on the theory that it was an inflammation, supported by the observation that the blood drawn from the rheumatic patient presented the same appearances as that drawn from one with pleurisy, a condition then universally described under the pathological heading inflammation. His first proceeding was to order ten ounces of blood to be taken from the arm on the side affected. The next day the bleeding was repeated; after one or two days there was a third bleeding, and after three or four days more a fourth bleeding, which was generally the last. A cooling julep, which was little more than a draught of sweetened water, was to be taken at the patient's pleasure. The painful joints were to be relieved by a poultice of white bread tinctured with saffron or by the repeated application of a cabbage-leaf. The diet was one of barley and oatmeal broth, all meat or meat broths being absolutely forbidden. The patient was allowed to drink small beer, everybody's daily drink at that time, or ptisans of barley, licorice, or sorrel boiled in water. He was to keep some hours every day out of bed. On the alternate days to the bleedings enemata of milk with sugar were given and for eight days after the last bleeding. After that a purge was to be taken in the morning, and the same evening a large dose of diacodium in cowslip water. Then the patient was allowed gradually to return to his wonted way of living with one caution—that he should drink no wine and no spirits and should avoid salted and spiced meats and anything difficult of digestion for a long time. "Pains," says Sydenham, "will thus be lessened, but will remain about for a long time."

Dr. Peter Mere Latham, who wrote in 1845, whose knowledge of the practice of his day went back to a few years before the battle of Waterloo, had seen rheumatic fever treated by bleeding, by opium (2 to 5 grains every twenty-four hours), by calomel, by colchicum, and by drastic purgatives. When he was a student at St. Bartholomew's Hospital from about 1810 to 1814 the treatment of rheumatic fever usual there was to give a dose of liquor ammoniæ acetatis three times a day and an opiate at night—a humane method perhaps traceable to the practice of the enlightened David Pitcairn. He himself thought bleeding expedient in many cases. His view about it in the reign of Queen Victoria was much the same as that of Sydenham in Charles II.'s. He had used opium with success, though as, unlike Sir William Gull, he had never thought it right to leave cases quite untreated, he had, he admits, no sufficient standard of comparison to tell him whether he had done more than relieve pain. On the whole he thought that the best plan of treatment was that by large (10 to 20 grains) and repeated doses of calomel followed by purgatives.

The author was a clinical clerk at St. Bartholomew's Hospital about a quarter of a century after the end of Dr. Peter Mere Latham's active life in his profession, beyond which his honored age lasted for many years. His method was entirely obsolete, and the general method of treatment of rheumatic fever was by alkaline salts. This method and several others have

since become obsolete, and for the present, so far as the Pharmacopœia is concerned, it seems clear that the salicylates are much more efficient than any remedy of past times. They lead to a rapid cessation of the pain and swelling of the joints, and when continuously administered in the dose proper to each patient over several weeks they seem, so far as the temperature chart and the absence of further symptoms enable one to judge, to prevent the further development of the organism in the endocardium or to destroy it altogether. The difficulties of administration which occur in particular individuals can generally be overcome by a little ingenuity in prescribing. A more rapid extermination of the organism is desirable, and for this we have yet to seek a drug. For the present that which we have does a good deal for the relief of the patient's pains, while it is not imperative in the process of terminating his malady.

We rightly regard keeping the patient sufficiently long in a condition of absolute rest in bed as one of the greatest modern improvements—as compared with the practice of past times—in the treatment of enteric fever, and the author thinks we may believe that there is no practitioner of medicine in England who fails to carry it out thoroughly. He urges the importance of a similar unanimity with regard to rheumatic fever. His experience leads him to the belief that there is always fear of redevelopment of the disease if the patient is allowed to leave his bed till his temperature has been absolutely normal without any rise whatever above the normal line, for three weeks at least from the last rise. Long after this he ought to be watched day by day with the aid of a temperature chart; and if in the week of his leaving bed or later any definite rise is observed, he ought to go back to bed for a further three weeks. If no rise occur he ought still to continue under observation for three months, if possible, taking salicylates or similar drugs in adequate but diminishing quantities, and all this time his life should be so ordered that no strain is put upon his heart. If he is a boy at school he is not to take part in games all this time. If he is at home he is to take carefully regulated exercise and to have one rest or more in the day as well as a long night.

Perhaps in hospitals it may prove that three weeks of normal temperature is not enough before allowing the patient to get up. This may be discovered when three weeks have come to be generally adopted as a minimum period. It is the opinion of the author that an earlier day of getting up only leads to prolongation of the disease.

One point which he wishes to urge about the valvular disease due to rheumatic fever is the importance, when we see such cases, of taking the temperature or asking for a temperature chart. Thus only can we be certain that endocarditis is not present and that our treatment ought not to require that the patient stay in bed. Most physicians have seen children who walked to the hospital, and who had the day before played about, who, when examined, had raised temperature and such marked alternation of cardiac sounds that it was certain they had had endocarditis for several days. Arthritis was, of course, present, but of some small joint and causing only a little pain. Thus, when seeing a case of valvular disease in a young person, the first question to which the observer must ascertain the answer is not when had he rheumatic fever, but has he got rheumatic fever at present? Thus the observer will come to know whether he has to treat a condition of acute endocarditis or one in which he is to try to relieve the heart in difficulties which it suffers from this or that simple or complex valvular defect.

Moore believes (1) that rheumatic fever is a single definite disease; (2) that endocarditis is always an essential part of it; (3) that its duration may extend over many years, and that these circumstances, but half demonstrated as they necessarily are at present, are still the safest indications of method in the treatment of the disease.

Lord Lyndhurst, the Chancellor, once said in conversation, "I consider that the worst exaggerator is the person who understates." The remark was original and wise.

It is illustrated in the books of many writers on rheumatic fever. They understate the conclusions which their own experience would allow. The author has tried to avoid this fault and to state the conclusions to which his own experience has led him without abatement and without reservation. He has ventured to risk the censure which might attend such a course because he believes that the adoption of these opinions would not merely lead to a saving of lives but also to the prevention of many of the fatigues, disappointments in work, checks in usefulness, and other inconveniences which follow the valvular disease consequent on the endocarditis of rheumatic fever.

CARDIAC ARRHYTHMIAS AND THEIR TREATMENT.

SATTERTHWAITE in the *Medical Record* of May 15, 1909, in writing on this subject says that so far as treatment is concerned we are taught by recent studies that better methods of diagnosis lead up to better methods of treatment.

In the matter of disturbed rhythmicality there are certain normal variations that do not merit treatment; and functional disturbances should be traced back to their cause, and the underlying conditions treated; while the disturbance may be brought about by overdosing with digitalis or its congeners, where the line of treatment is apparent.

Extra-systolic arrhythmias may also have a functional cause, as when due to reflexes from the gastrointestinal tract, as in indicanuria; also in the coffee and tobacco heart, when the therapeutic indications are plain. When due to high blood-pressure plenty of outdoor exercise is indicated (MacKenzie).

In errors of contractility and in nodal rhythm, the ataxic conditions being due to myocardial diseases, adherent pericardium, dosing by digitalis, asphyxia, etc., the therapeutic indications are for a very intelligent dosage with heart stimulants, or vasomotor drugs; carefully regulated diet, perhaps baths, exercises, etc., while in loss of conductivity as well as in nodal rhythm the possibility of syphilis must ever be kept in mind, and the importance of treatment by mercurials.

Patients with mild arrhythmias, whether young or old, should not be unnecessarily alarmed, young people especially; but older people should be forewarned. As a rule baths have a soothing effect on arrhythmia.

INTRAVENOUS INJECTION OF STROPHANTHIN IN HEART AFFECTIONS.

DANIELOPOLU (*Arch. des Mal. du Cocur des Vaisseaux et du Sang,* November, 1908) has treated 23 cases of chronic heart affections by intravenous injections of strophanthus, and embodies the results obtained in a short paper. His 23 cases consisted of 8 mitral cases, some of which were accompanied by myocarditis; 6 cases of chronic myocarditis; 3 cases of aortic lesions, with chronic nephritis; 3 cases of asystole in emphysema, accompanied with advanced chronic nephritis. The dose of strophanthus employed was 1 milligramme, which was repeated not sooner than twenty-four hours after the first injection. In some cases a single injection has sufficed to relieve asystole, but usually two or more injections have been necessary. In no case in which the doses have been repeated has any symptom of accumulation of the drug in the system shown itself. The strophanthin employed was prepared by Merck and employed in aqueous solution, which was sterilized before being injected.

One of the most marked effects of these intravenous injections was the extreme rapidity with which the drug acted. The author found that in cardiac cases with very advanced renal lesions the results obtained by intravenous injections of strophanthin were not so good as in cases in which the kidneys were less seriously involved; in fact, where there was intense chronic nephritis, the improvement made was very slight. The author observed also, as did Tust and Hoepffner, that in cases of cardiac lesion and chronic nephritis, although the injection of strophanthin has had no immediate effect, yet it has prepared the way for the

action of theobromine, which, given to the same patients before they had received any strophanthin, caused no diuresis.

As a result of his experience with the intravenous injections of strophanthin in cardiac affections, the author concludes that strophanthus should be considered one of the best cardiac tonics, the advantage it possesses over other cardiac tonics being: (1) The rapidity and energy of its action on the heart; (2) its exclusive action on the heart; (3) the possibility of one knowing the exact amount of the drug one employs. He also considers that the intravenous method is the best way to give strophanthin, and that this method does not cause the pain and edema which follow subcutaneous injections. The dose employed should be 1 milligramme of strophanthin, which may be repeated at intervals of twenty-four hours. Strophanthin strengthens the heart-beat, slows the pulse, and increases arterial tension; further, it favorably influences the cardiac rhythm. It increases diuresis, causes edema to subside and passive congestions to disappear. Lastly, its action is very rapid. In none of his cases has the author observed any untoward symptom as a result of this method of treatment.—*British Medical Journal,* May 1, 1909.

THE TREATMENT OF ACUTE RHEUMATISM.

A. Plehn (*Deutsche medicinische Wochenschrift,* Nos. 51 and 52, 1908) discusses the treatment of acute rheumatism, and emphasizes the wrong principle which appears to be gaining ground, to throw overboard the older salicylates, on account of their supposed toxic effects on the kidneys. Leuthje was the first to demonstrate the changes in the urine which are present when salicylates are given even in moderate doses. Klemperer considered that it is necessary to use the smallest doses possible, in order not to expose the kidneys to the toxic influence. Hauffe, representing the Schweninger school, which refuses all medicamental treatment, claims to have obtained excellent results without salicylic acid. However, closer investigation has shown that the renal irritation of salicylic acid is more imagined than real, and that perfectly normal, healthy persons frequently pass minute traces of albumin, and even casts, without taking any of this drug. These forms of albuminuria not infrequently clear up while the patient is taking salicylates. Plehn considers that even if slight irritation of the renal apparatus were produced by this drug, since it acts specifically in rheumatic fever, just as mercury acts in syphilis and quinine in malaria, it would be wise to give it freely. He believes that it is necessary to give it in large quantities in order to obtain the full specific effects. First, however, it must be certain that the rheumatic affection is really acute. He prefers pure salicylic acid to the sodium or other salts. He gives it in doses of 1 gramme (that is, about 16 grains) every two hours, or 0.5 gramme every hour during the first day, but none during the first night. On the following days he gives 6 grains in ½- or 1-gramme doses. This is continued until the temperature has been normal for three days and all pains and complaints of all sorts have disappeared. Then he gives 4 grammes a day for a week, and after three further days, during which the patient remains in bed but receives no salicylic acid, he allows him to get up, provided that no further symptoms develop. Men stand the doses better than women, and he finds by experience that the proper dosage of this drug can be calculated at 0.08 gramme per kilo body weight per day (this corresponds to about 7½ grains per stone). When salicylic acid produced disturbance of the stomach, or other indications caused him to modify the doses, he preferred to substitute aspirin in doses of ½ gramme, given six to eight times a day. With these doses both of the acid and of aspirin the body weight often increased during the medication, the kidneys were not attacked, and even during a nephritis the condition of the kidneys improved.

Next the writer finds that salicylic acid acts prophylactically as far as the heart is

concerned. Complications such as endocarditis and pleurisy occurred less frequently when salicylic acid could be given freely from the first than in those cases in which it was withheld. He brings forward evidence to show that this drug is not a cardiac poison when given as he has described.

Next he deals with the actual frequency of heart affections in rheumatic fever, and shows that among 319 cases treated by him with salicylic acid, only two left the hospital with chronic heart disease due to the attack of fever for which the patient had been treated. Those cases which are treated outside without sufficient salicylic acid, and which when admitted prove refractory toward the influence of the drug, usually do well when treated by injections of quinine and antipyrin, or by intravenous injections of collargol. Finally he compares his results with those of Hauffe, who deals with his patients by means of so-called physical therapy, and shows conclusively that his results are considerably better.—*British Medical Journal,* May 1, 1909.

FLIES AND MILK CONTAMINATION.

This important subject in the prophylaxis of disease is discussed by the *Medical Record* of May 15, 1909. As it well says, the most striking feature of modern scientific research has been the conclusion generally reached that insects are largely responsible for the spread of destructive epidemics and of some endemic diseases. To the mosquito has been traced the rôle of disseminator of malaria and yellow fever. The rat flea is regarded by many authorities as responsible for the wide-spread propagation of plague, and sleeping sickness is conveyed to the human subject by means of a fly. This list, of course, does not exhaust the number of insect-borne diseases, and indeed it is shrewdly suspected that members of the insect tribe have much to do with the spread of most tropical maladies.

Up to a comparatively recent time the common house-fly was looked upon only as a nuisance, and no one thought it to be a mischievous agent in the conveyance of certain diseases. But now war is being declared and waged against it, for the reason that it has been proven a prominent factor in the spread of more than one dangerous malady. That typhoid fever is not infrequently carried from place to place by the agency of flies has been demonstrated sufficiently clearly to allow it to be stated as a fact. That flies sowed the germs of typhoid fever broadcast during the Spanish-American war was abundantly proved. This view of the dangerous possibilities of flies was confirmed during the Boer war to the satisfaction of those who made a study of the subject, and now few will be found to deny that typhoid fever is often spread far and wide by these innumerable and persistent pests.

Another fly-borne affection of a deadly nature is epidemic diarrhea, and the evidence in support of the contention that flies are largely concerned in the dissemination of infantile diarrhea, especially in urban districts, is so convincing as to be practically irrefragable. But this is almost wholly, after all, a question of a pure milk supply, for it is by contaminating milk that flies play their part in spreading epidemic infantile diarrhea. There can be no doubt that if milk is effectually protected against flies diarrhea among young town children would be much less prevalent than it is now. Dr. J. T. C. Nash, writing in the *Lancet* of December 5, 1908, demonstrated by means of experiments undertaken by himself the close connection between flies and epidemic diarrhea. The results of his experiments with exposed and protected milk proved that a marked and rapid deterioration of milk exposed to flies took place, there being in the course of twenty-four hours approximately 40,000,000 more bacteria per cubic centimeter in the exposed milk, and ten times as many organisms capable of growing on agar at the body temperature. In round numbers, the exposed milk showed 700,000 bacteria per cubic centimeter capable of growing at the body temperature, against only 70,000 bac-

teria in the case of milk protected from flies.

In all large cities there are in the hot weather an immense number of flies. Furthermore, milk in the poor districts is never properly protected. The consequence is that flies contaminate the milk to a fearful extent. The greater the number of the flies the greater the milk pollution, and in fly-ridden districts infantile diarrhea of an acute and virulent type is almost certain to prevail unless extreme care be taken to protect the milk.

It would undoubtedly be a very difficult and perhaps an impossible task to keep flies down to such small numbers that they would be no source of danger to human life. But a well-conducted war against flies could but result in a considerable diminution of their number, with a correspondingly satisfactory outcome so far as infantile diarrhea is concerned. In the meantime milk sellers and mothers can effect much by displaying great care in the protection of milk. Unfortunately many people are lamentably ignorant in regard to the bad results which are certain to follow carelessness in protecting the milk supply, and need education both by example and by precept. Medical and lay journals should lend their aid in furthering this object.

PARACENTESIS THORACIS IN PLEURITIC EFFUSIONS.

In the course of quite an exhaustive article on this topic contributed to the *Medical Chronicle* for May, 1909, MARSDEN tells us that the point of view from which we consider a pleuritic effusion exercises, in the opinion of the author, a dominating effect on the treatment, and is, he believes, largely responsible for the two diametrically opposite schools of teaching as to the proper procedure. Of these two schools one recommends the immediate withdrawal of all fluid as soon as its presence is detected. Its supporters state that the existence of fluid in the pleural cavity is not good for any lung; thus Bonney says "no individual can be expected to derive benefit from a pleural effusion." They also hold the opinion that its early removal gives less risk of cirrhosis and contraction of the lung, bronchiectasis, chronic interstitial pneumonia, and deformities of the chest. In this connection most of the advocates of early removal apparently exclude from this category cases with active tuberculosis of the lung on the affected side.

But to return to our cases of apparently primary acute pleurisy, the other school of practitioners recommend that a variable period of two to three weeks should be allowed to elapse, if possible, before withdrawing the fluid. They consider that since the active stage is usually of about ten to fourteen days' duration, and since the effusion may be expected to continue during the active stage, there is less risk of reaccumulation, or of pleuritic adhesions. Thus Barr says "the effusion is a natural process, which if it continues till after the inflammation has subsided lessens the risk of pleuritic adhesions," and Powell says "a certain amount of effusion is useful in separating and bathing in a bland fluid the tender and inflamed surfaces, and further, in keeping at rest the affected portion of lung." In addition he states that "it is too often forgotten that the lung is in health exercising a constant traction upon the pleural sac, the vessels of which have therefore to sustain a negative or aspiratory pressure; this being so, it is but natural and physiological that, if these vessels become temporarily weakened and congested by the inflammatory process, increased exudation should proceed from them."

The two lines of argument are apparently unanswerable, and the question arises which is the most important and serious factor? If the removal of the fluid tends to maintain the active process it would manifestly be inadvisable to interfere. Osler, however, says that the "presence of fever is not a contraindication; indeed, sometimes with serous exudates the temperature falls after aspiration," and Taylor also refers to the improvement in the temperature and in the local conditions which follows removal of fluid.

Then with regard to the occurrence of adhesion of the pleuræ it seems that this *per se* is an unnecessary *bête noire*. How often do we find it post mortem where its presence had never so much as been suspected? With complete expansion of the lung the pleuræ can apparently be adherent without causing any abnormal physical signs which we can detect, or symptoms of which the patient complains. It is quite true that the ability of the pleural surfaces to glide smoothly one over the other readily permits of a uniform expansion of the whole lung, but the irregular expansion of the lung with adherent pleuræ, which must follow from the very variable range of movements of different parts of the chest wall, does not seem to constitute so serious a deviation from health so long as the lung has retained its power of expansion and contraction. In any case the writer thinks we can with safety maintain that it is far from being so important a drawback as the existence of a contracted lung.

He is therefore of the opinion that in all cases attention should be primarily given to the state of the lung, and that our efforts should be directed to the maintenance of this organ in the most expanded condition possible, when the termination of the disease occurs.

Which of the two schools mentioned is the more likely to meet this view? The author himself thinks the method of immediate removal of the fluid, and he agrees with Osler that "early and if necessary repeated aspiration of the fluid is the most satisfactory method of treatment." Is it necessary in all cases to act so promptly? Of course all practitioners are in agreement that in the presence of any urgent symptoms or with very large effusions, immediate interference is indicated. But in the absence of such conditions Kingston Fowler, after recommending the practitioner to wait two or three weeks, says "there is but little danger in a case of serofibrinous effusion of this duration that the lung will not reëxpand if absorption occurs."

From what Marsden says it would seem that the probability of reëxpansion is dependent on the amount of exudation on the surface of the visceral pleura and the degree of inflammatory effusion into the underlying tissue. Where these products are scanty in amount it is readily conceivable that no harm will follow from leaving the fluid the full time in the pleural cavity. The author believes it is quite true that this is the pathological condition in the great majority of cases. But he thinks it is none the less a fact that occasionally cases with excessive exudation from the first as described by Powell do occur, and the question arises, can we detect these cases?

THE ALCOHOL INJECTION TREATMENT FOR NEURALGIA AND RHEUMATISM.

HARRIS in the London *Lancet* of May 8, 1909, has this to say in regard to the technique for the injection treatment of trigeminal neuralgia:

In all cases of trigeminal neuralgia all tender spots, irritation of which gives rise to the pain, should be injected subcutaneously with several drops of the 80-per-cent alcohol. This is a comparatively simple procedure. Next, the various superficial foramina, such as the mental foramen for the third division, the infraorbital foramen for the second division, and the supraorbital notch if the ophthalmic division of the nerve is affected, should also be injected with a few drops of the alcohol. Of these the mental foramen is the most difficult to hit. Other foramina that may also be injected in suitable cases are the inferior dental, the palatine, the malar, and the anterior ethmoidal for the nasal branch of the first division. For the inferior dental a strong curved needle must be used, and it may be reached either around the back of the ascending ramus of the mandible or from within the mouth.

Deep injections of the second division of the fifth nerve in the sphenomaxillary fossa at the foramen rotundum and of the inferior maxillary nerve at the foramen ovale require a great deal of practice. This must be acquired first upon an articulated skull,

and then in the post-mortem room. Many articulated skulls should be studied in order to become familiar with the bony variations that are liable to be met with in the zygomatic fossa, and in order to become acquainted with the varying depth of the foramina from the surface in different sized skulls. Although general directions can be given for reaching these two deep foramina, unless absolute familiarity with the base of the skull in this region is attained to the degree of being able to call up a mental picture of the parts, and thus recognize what the point of your needle is doing, frequent failure is sure to result and great damage may be done. In order to attain the certainty of placing his injection in the foramen ovale, or foramen rotundum, the author has found it necessary to practice on a large number of articulated skulls and on over 60 bodies in the post-mortem room, using methylene blue for his injection in the latter, and tracing the course of the injection after taking out the brain. His methods are, roughly, as follows:

For the foramen ovale he uses a moderately stout hollow needle, 1 to 2 millimeters in diameter, with a short point, without a stylet. This is pushed through the cheek below the zygoma, on a line joining the ala nasi with the incisura notch of the ear, and about 1¼ inches in front of this notch. If pushed in horizontally the point of the needle will sometimes strike the ramus of the mandible just below the sigmoid notch, but depressing the handle of the needle slightly will allow the point to slip through the lowest level of the sigmoid notch into the zygomatic fossa. Directing the needle slightly upward and backward the base of the skull will be reached at a depth of about 1¼ inches, the point of the needle striking the under surface of the great wing of the sphenoid. The handle of the needle must then be depressed and the point of the needle be made to slide along the bone until it engages in the foramen ovale, at a depth usually of 1¾ inches. In some skulls the needle must be directed more upward, as high as 30 degrees upward, and in others it must be directed at the same angle backward. If the needle is pushed in too horizontally the wall of the pharynx will be pierced at a depth of from 2 to 2¼ inches, or again, if it be pushed too far through the foramen ovale, the cavernous sinus and internal carotid artery will be punctured. To avoid this the needle should never be passed through the foramen to a greater depth than 2¼ inches from the surface, even in those cases in which it is thought advisable to inject the ganglion itself. If the neuralgia is limited to the third division of the nerve it will be sufficient usually to inject the nerve itself at the level of the foramen, without passing the needle through into the ganglion. Brissaud and Sicard adopt the landmark of the posterior edge of the external pterygoid plate, which will be struck at a depth of about one and a half inches, and then feeling with the point to its upper and posterior edge, when the needle will slip back into the foramen which lies immediately behind it. They also sink the needle in nearer to the zygoma. This line has two disadvantages, as the direction of the needle must be altered after it has been sunk deeply, which is not always easy to do, and, more important, the needle is likely to be caught under the pterygospinous ligament, and thus prevented from reaching the foramen ovale at all. Sometimes this ligament is completely ossified by a bridge of bone joining the upper and back border of the external pterygoid plate to the spine of the sphenoid, forming a foramen which would be mistaken for the foramen ovale. Indeed, it is clear from the description of their method that they have fallen into this error in at least one case. They recommend a fine platinum needle, of 0.7 millimeter diameter only. The author does not find a fine needle nearly so satisfactory as a stouter one, though he does not consider it necessary to use such a stout one with a stylet as recommended by Schlösser, and adopted by most of his followers. The author finds that a fine needle bends so easily that it is quite impossible to be sure that the point of the needle is following the changes of direction given to the handle, and he does not find that the

stouter needle causes any more vascular injury than does the fine needle. The internal maxillary artery turns into the zygomatic fossa at the level of the bottom of the lobe of the ear, which is well below the bottom of the sigmoid notch, and the only branch liable to injury is the middle meningeal, and the needle should not be directed far enough backward to damage this vessel.

The foramen rotundum is best reached by sinking the needle below the malar bone in front of the coronoid process slightly in front of a line prolonging the posterior border of the orbital process of the malar across the zygoma. The needle should be sunk inward, backward, and upward, at an angle of about 40 degrees upward and 30 degrees backward. The needle will then strike the anterior border of the external pterygoid plate at a depth of about 1¾ inches, and the point of the needle should then be directed slightly forward so as to slip in front of the anterior border of this plate through the pterygomaxillary fissure into the sphenomaxillary fossa. Directing the needle at the same angle upward the point will reach the superior maxillary nerve at its point of exit from the foramen rotundum at a depth of about two inches from the surface, though in the same skull of a woman of the height of 5 feet 2 inches the foramen rotundum will be reached at a depth of only 1¾ inches. It is most important to remember the depth at which the foramen lies, as it is not always possible to make the point of the needle engage in the foramen owing to the backward projection of the antrum in some skulls narrowing the pterygomaxillary fissure to such a degree that the needle passes in front of the foramen and cannot be made to pass into its anterior lip. If the needle be pushed farther in the same line for three-eighths of an inch the optic nerve will be struck at the optic foramen, and in some skulls it is possible to push the needle straight through the sphenoidal fissure into the brain. When injecting the superior maxillary nerve, therefore, the needle must never be sunk to a greater depth than 2¼ inches from the skin for a large skull, as of a man of 6 feet in height, or more than 1¾ inches for the small skull of a woman of 5 feet in height. If the needle cannot be felt to engage in the foramen rotundum the injection must be made at the required depth, and it is then always perineuritic, the nerve trunk not being actually pierced. Fifteen minims of the strong alcohol slowly injected is perfectly safe from injuring the optic nerve or the third nerve if the precautions as to depth are observed.

Schlösser, Brissaud and Sicard, and all the other users of this method whose writings the author has perused, employ no general anesthetic, principally for the reason that the patient is able to inform them by a scream of pain when their needle reaches the nerve. In cases of trigeminal neuralgia especially the author prefers to perform the injection under general anesthesia, as thereby perfect stillness of the patient is insured, and he is not conscious of being hurried, and can therefore perform the injection far better. If the bony anatomy of the parts is thoroughly familiar, as he has already urged to be absolutely essential, it will be unnecessary to require the information from the patient as to when the nerve is reached, though this sign may be also secured by allowing the patient to come round partially from the anesthetic after the needle has been inserted and the point is ready to strike the nerve. The patient will then be seen to give a twitch of the face as though in pain, though afterward no memory of the pain remains.

It is almost needless to remark that the strictest antiseptic precautions are necessary. Some advise keeping their needles in absolute alcohol, but the author always boils his needles in one-per-cent bicarbonate of potassium in distilled water immediately before use. The skin is sterilized with ether soap and is then rubbed with a little lysol, which is mopped off with absolute alcohol. The puncture wound is sealed with a small collodion dressing, which may be taken off after the third day.

A certain amount of edema of the face is constant after alcohol injections, but this

is of no consequence and it passes off after two or three days. Hematomata sometimes result from puncture of an arterial branch, but the writer has only encountered this once, when puncture of the infraorbital foramen while injecting the infraorbital nerve caused a slight hematoma of the lower eyelid and adjacent skin of the cheek.

In conclusion the author is of the opinion that this method is a certain relief for trigeminal neuralgia, and though recurrence of the pain is likely after an interval, varying from four or five months to as long as eighteen months, it is perfectly simple to repeat the injection whenever necessary. This appears to him far preferable to the more serious operation of extirpation of the Gasserian ganglion, and certainly should at all events be tried first.

In addition to trigeminal neuralgia, this method is of great service in controlling clonic facial spasm, and also other forms of neuralgia, such as postinfluenzal supraorbital neuralgia, the facial pain of inoperable carcinoma of the tongue or jaw, and in chronic sciatica. Tabetic neuralgia affecting the lower limbs and other causes of severe persistent neuralgia below the middorsal region he considers may possibly be also relieved by this method, by injecting the spinal nerves at their point of emergence at the intervertebral foramina. These foramina he has found comparatively easy to reach for the lower dorsal lumbar and upper sacral roots.

DEAFNESS FOLLOWING FEBRILE DISEASES, AND ITS PREVENTION.

In the *New York Medical Journal* of May 15, 1909, PRATT closes a paper bearing this title with these words:

1. The majority of ear diseases are caused by adenoids and enlarged tonsils.

2. These conditions are in the greater proportion caused by mechanical obstructions of the Eustachian tube.

3. The germs found in the secretions are present in the normal middle ear as they are in the nasopharynx and sinuses.

4. While varying in different parts of the country, from twenty-five to thirty per-cent of the children have adenoids or enlarged tonsils.

5. All hypertrophied lymphatic tissues of the nasopharynx should be early and completely removed so that mechanical obstruction of the Eustachian tube will not occur during congestion of the nasopharynx, thus interfering with the drainage and ventilation of the middle ear.

INTRAVENOUS INFUSION: ITS TECHNIQUE.

As a record of his experience in five thousand intravenous injections FRALICK writes in the *Chicago Medical Recorder* of May 15, 1909. After detailing many familiar facts he deals with injections, and says that should any uncomfortable sensation be experienced by the patient, the bottle should be lowered, thus reducing the pressure, and raised again as soon as relief is afforded. About an ounce of liquid should be kept in the bottle, some of which should be allowed to flow into the wound as the cannula is withdrawn from the vein.

It does not seem to make the slightest difference whether we ligate the vein and occlude the lumen or suture the opening and leave the lumen undisturbed. There need be no anxiety concerning the returning blood. This is cared for, and is doubtless due to the plentiful supply of veins, their abundant distribution, and the numerous communicating branches.

The author states he has seen air enter the different veins in considerable quantities without disturbing the patient in any way, notwithstanding the alarming statements found in text-books to the contrary.

Another popular fallacy to which the author calls attention is that it is exceedingly dangerous to allow a solution to enter the vein rapidly. He has given this aspect of the subject very careful attention, and does not find that it makes any difference whether we put 500 Cc. of a solution into the vein in three minutes or in thirty minutes, except that when thirty minutes is consumed in the operation, and when we

have no means of keeping the liquid at a constant temperature, he considers it unnecessarily wasteful of time, unwise, harmful, and sometimes even dangerous. Four to seven minutes is sufficient time in which to introduce 500 Cc. into the vein of any patient, and he is confident that no difficulty will be experienced if this rule be followed; the exceptions being those cases in which there is a dilated heart, or those in which structural changes have taken place in the coats of veins.

He has never seen embolism arise during the infusion of a saline or other solution into the vein. A thrombus may develop during an intravenous infusion. This is manifested by a feeling of discomfort and by swelling, and later a discoloration along the course of the vein at or near the seat of the operation. He attributes the formation of a thrombus mainly to a weakened condition of the coats of the veins. The increased blood-pressure, resulting from the solution flowing into the veins under too great a pressure, overdistends and sometimes ruptures the diseased vessel, or the same may happen to a small communicating branch in the vicinity of the field of operation. A thrombus may also arise from irritation of the mucous coat of the vessel, caused by the solution being of improper concentration or of excessive acidity or alkalinity, or possibly to the presence of thrombo-kinase in the walls of the veins.

A simple phlebitis may also arise from any of the foregoing causes, and usually accompanies the formation of a thrombus. Chills and rigors, high or low temperature, rapid heart action, excessive pains in the lumbar and other regions of the body may occur.

Hematuria is not infrequently observed, and is explained by the following considerations: The corpuscles may be injured by knocking together. They will rupture if the solution is hypotonic, or they will shrivel and present a cremated appearance when the solution is hypertonic. These changes in the corpuscles the author has frequently observed, and he has often proved by experiments that the stability or destruction of the corpuscles depended not on any chemical action of the entering fluid on the blood-corpuscles, but entirely on the physical relation between the contents of the corpuscles and the blood when changed by the admixture of the foreign fluid with it. If the fluid that is introduced has a very low percentage of inorganic salts, then there will be endosmosis into the corpuscles until the latter burst, unless the inflowing stream is so slowly admitted as to but slightly change the blood; thus distilled water is as deadly in its effect on the blood-corpuscles as the so-called poisons are on the organism in general. On the other hand, any fluid allowing exosmosis from the corpuscles shrinks the latter. In this case the fluid is hyperisotonic. The corpuscles usually regain their shape and volume. It is hypoisotonic fluids that destroy the corpuscles, and thus produce hematuria. The chills, temperature, tachycardia, and other objectionable symptoms are probably all due to the hemolysis, which surely follows the intravascular injection of a hypoisotonic fluid.

With proper care these conditions should not arise, and since they can be avoided the possibility of their occurrence should not cause alarm. If the solution which is to enter the blood-stream is isotonic with the blood, and is approximately of the same electric conductivity, exercises the same osmotic pressure, and if of the same viscosity and alkalinity of normal blood, the occurrence of any of these distressing phenomena should be almost impossible.

OPHTHALMIA NEONATORUM AND ITS PROPHYLAXIS.

BULL contributes an article on this subject to the *New York Medical Journal* of May 15, 1909. He reminds us that the various steps in the preventive treatment introduced by Professor Credé are as follows: For several days before the expected confinement the vaginal passages of the woman are carefully irrigated by some antiseptic solution, preferably mercuric bichloride, in order to remove as far as possible all

infectious secretions. It is not possible to render these passages thoroughly aseptic, but they can be made relatively so. As soon as the child has been born, the face and scalp should be cleansed with sterilized water, especially about the eyelids. The eyelids should then be opened and one drop of a two-per-cent solution of silver nitrate should be dropped into each eye from an aseptic dropper or a glass rod. But little reaction usually follows, but should it occur, it can be readily controlled by cold compresses soaked in a two-per-cent solution of boric acid or salicylic acid. If these precautions are adopted, the disease will generally be prevented.

So grave a calamity is blindness from purulent conjunctivitis, that the use of this precautionary method has been urged at the birth of every child. But we should go slowly in absolutely recommending the universal application of this method, for in the hands of ignorant, dirty, and careless midwives it might do harm in unsuitable cases. It should, however, be borne in mind and resorted to whenever there is a probability that the mother is infected with gonorrhea. This can readily be settled in every case by making a bacteriological test of the vaginal secretions before the birth.

It is a most significant fact that since a full knowledge of this method has been disseminated among the members of the medical profession, wherever statistics have been kept, there has been a most marked diminution in the number of cases of the disease.

It is therefore the manifest duty not only of ophthalmic surgeons and obstetricians, but of every member of the medical profession, to use every means in their power to extend among the laity of all classes, and especially among the poor, in whose families the disease is met with most frequently, a knowledge of the danger to the eyes of new-born infants from this disease, and to rid them of the idea that it is merely a simple "cold in the eyes," and prevent their resorting to manifold household remedies, such as a little breast milk, or a tea-leaf poultice, or, worst of all, washing out the eyes of the infant with urine from the infected mother.

This is a matter which concerns the state in an important degree, and is very properly a subject for legislation. Most of the European governments require by law the reporting of all cases of ophthalmia neonatorum to the constituted authorities. Many of our own States have passed laws making the report of cases of this disease compulsory. But it is not enough to pass such laws; we must see that the laws are enforced with stringency, and the penalty for failure to comply with the requirements of the statute should be a heavy fine, and in case of a second violation of the law by midwives their license should be revoked. Such laws, when enacted, should bring all cases of ophthalmia neonatorum, as soon as they occur, under the care of some person competent to treat them. Moreover, in addition to general legislation, it is necessary that the laity be thoroughly informed of the dangers of a disease which too many of them have been accustomed to regard as simple and harmless. All charitable institutions and organizations which have to deal with women about to become mothers, or with those having the care of infants, should keep the women informed of the necessity of carefully watching the eyes of newly-born infants, and of the need not only of calling in a physician as soon as any symptoms appear, but also of the wisdom of taking precautionary measures such as those of the Credé method. This plan of prophylaxis is at once simple, safe, and inexpensive, and if universally employed would have saved the eyes of many thousand children who because of this neglect have passed their lives in darkness. There is no doubt that through the unceasing efforts made by physicians during the past few years the number of cases of infection due to this cause and the amount of blindness resulting from this infection have been greatly diminished. But very many cases occur with the most disastrous results, which are never seen by physicians, but are cared for by midwives, and we only become aware of their existence when statistics are

sought as to the cause of blindness. Moreover, there seems to have been no concerted effort in the past on the part of the health authorities to determine just how frequently the infection occurs, under what conditions it may be looked for, or how the eyes of the new-born infant may be adequately protected.

We have entered upon a campaign of education which must be loyally carried out. The first essential in any movement of this kind is to bring about a public understanding of the conditions, and secure the sympathy and assistance of the people in our endeavors to carry it out. One powerful means of developing watchfulness and care is the publication in health bulletins of the dangers of infantile ophthalmia, and the possibility of its prevention. Then it is all-important to fix on an effective and satisfactory antiseptic, which can be used even by unskilled hands without causing damage. The author's own experience has taught him that, except where the disease already exists, a two-per-cent solution of silver nitrate is too irritating and is likely to cause what is known as "silver catarrh." After a very large experience he now recommends a one-per-cent solution, as non-irritating and at the same time an effective bactericide. This solution can be employed by inexperienced physicians and ignorant midwives with perfect safety.

Another step in the campaign of education is to inform prospective mothers and others of the danger which threatens the eyes of the new-born child, from which they can be protected by the use of the prophylactic, and thus induce them to seek and demand its use.

Still another step in this campaign is to teach not only the laity but the medical profession that the prophylaxis of the disease rests with the obstetrician or midwife. The case is brought to the notice of the ophthalmologist only after irreparable damage has been done. The physician attending at the birth needs explicit advice as to the proper employment of the prophylactic, and this advice is still more necessary in the case of midwives, who from ignorance or carelessness are often afraid to apply anything to the baby's eyes without exact information as to its necessity, and explicit directions as to the method of use. These midwives should all be instructed by printed leaflets for each in her own language, telling how to manage the child's head to keep infection out of the eyes. They should be supplied with the prophylactic, with directions as to its use. They should be compelled by law to report the condition of the eyes when they report the birth. This should also be done by all practicing physicians, at the same time stating what prophylactic was used.

THE PRACTICAL BEARING OF THE ANATOMY OF THE LYMPHATICS ON COLONIC RESECTION FOR CANCER.

Since cancer is disseminated through the lymphatic system, and since when it attacks the colon the diagnosis in the earliest stage is impossible and hence the lymphatics are as a rule involved, radical cure when operative intervention is called for necessarily implies on the part of the operator knowledge of the position of the lymphatic glands to which cancerous infection is first carried. For the purpose of securing information upon this point JAMIESON and DOBSON (*Proceedings of the Royal Society of Medicine,* March, 1909) conducted a number of injection experiments, drawing therefrom conclusions which are of great practical value.

In a previous paper they have already pointed out the relation which the ileocolic artery bears to the lymphatic vessels. They note that the right colic artery is a direct branch of the superior mesenteric in less than 50 per cent of subjects. In about 30 per cent it is a branch of the ileocolic, and in other cases it is represented by a branch of the middle colic.

The middle colic artery springs from the superior mesenteric artery in front of the head of the pancreas at or a little distance below the lower border of the body of the gland. It first passes downward and outward across the superior mesenteric vein,

sometimes in front, sometimes behind this vessel, and then enters the transverse mesocolon, between the leaves of which it runs downward, forward, and to the right toward the hepatic flexure. About midway between the root of the mesocolon and the colon it divides into two branches, right and left, which diverge from each other; each of these branches again divides close to the colon. These vessels form loops with the right colic near the hepatic flexure, and with the left colic; the last arcade being the longest and most important found along the intestinal canal, placed about two finger-breadths from the gut along the left two-thirds of the transverse colon. The middle colic supplies a portion of the ascending colon, the hepatic flexure and the right and middle thirds of the transverse colon. Secondary arcades between the vessels arising from the primary arches are infrequent in occurrence and inconstant in position.

The inferior mesenteric artery beneath the duodenum runs downward and to the left over the aorta, psoas muscle, and left iliac artery, and enters the mesorectum, becoming the superior hemorrhoidal artery. The inferior mesenteric vein accompanies it only in the lower part of its course. Its branches are the left colic and the sigmoid artery.

The left colic artery is given off high up from behind the duodenum. It passes to the splenic flexure and the left extremity of the transverse mesocolon, dividing into two branches at or to the right of the splenic flexure, the one forming with the middle colic the great arcade along the transverse colon, the other bending downward to form a long arcade with the highest sigmoid artery or short arcades with its own branches.

The sigmoid arteries arise from the left colic, and other sigmoid arteries may have their origin from it either separately or by a common stem. They form simple arcades with each other in the mesosigmoid, but the lowest sigmoid and the superior hemorrhoidal arteries do not anastomose in the same way as the individual sigmoid arteries. They stand in relation to each other as the diverging limbs of two arcades. The essential part of the communication between the lowest sigmoid artery and the superior hemorrhoidal artery is at the point of origin of the former. Hence ligature applied to the main arterial trunk below the origin of this artery will prevent collateral circulation through the arcades, whilst a ligature applied above the point of origin would allow of such collateral circulation.

The lymphatic glands of the large intestine are few as compared with those of the mesentery. They are arranged in chains corresponding with the vessels along which they lie. The right colic artery is inconstant, and even when present has few glands placed along its course. In each chain the glands tend to form groups at certain points. These groups are described by Jamieson and Dobson as epicolic, paracolic, intermediate, and main. By the epicolic glands are meant those that lie on the intestinal wall beneath the peritoneum and in the epiploicæ appendices. They are less numerous in young subjects and especially in the sigmoid flexure.

The paracolic glands lie along the inner margin of the gut, from the ileocolic angle to the rectum, between the intestine and the arterial arcades and on the arcades, and average in size that of a small pea. The intermediate groups lie about the stem of the middle colic artery and the left colic and sigmoid branches of the inferior mesenteric, and tend to cluster midway between the origins of the arteries and the gut.

The intermediate groups receive most of the efferents of the paracolic glands and some vessels from the gut which have slipped past these glands. The direct vessels are especially numerous and constant in the upper end of the ascending colon and the right extremity of the transverse colon, and were found in every well-injected case; from the splenic flexure these direct vessels were found in only four cases out of fourteen specimens; from the transverse colon in its central portion not at all; and from the descending colon in five out of fifteen specimens. The main groups which receive the efferent vessels from the intermediate

glands are in the middle colic area placed about the artery at its entrance into the mesocolon, forming a well-marked mass which may be confluent with the intermediate group.

The main left colic group lies chiefly about the horizontal part of the artery near its origin and is continuous with the inferior mesenteric main group above the origin of the left colic artery. The second set of glands lies about the terminal portion of the inferior mesenteric vein, in front of the head and at and under the lower border of the body of the pancreas, to the left of the superior mesenteric root-glands.

The inferior mesenteric main group lies about the stem of the inferior mesenteric artery, as far up as the left colic artery, where, joining the main left colic group, it becomes continuous with the lumbar glands. Its members are found not only under but on the artery. The inferior mesenteric group, from its very lowest part upward, sends a stream of efferents into the lumbar glands, not only to those on the left side of the aorta, but to those in front of it and between it and the vena cava. Hence it is continuous with the lumbar group for almost its full length and may be regarded as a lateral extension of the latter. As we descend the lumbar glands become more and more nearly related to the group. It is noted by the authors that over the left half or two-thirds of the transverse colon the lymph may reach the glands of the hilum of the spleen. It is moreover observed that there is a communication between the lymphatic and venous systems of the abdomen.

In applying these anatomical facts the authors note that the ideal operation consists in removing a considerable length of the gut on each side of the growth with the primary glands, together with the vessels running to them from the gut and the tissues in which these vessels lie. This necessitates a great extension in the range of the operation usually practiced and perhaps adds to the risk, though in some instances a wider excision will be attended by a lower mortality than a purely local excision. In some cases it is impossible to remove the whole of the lymphatic area, as for instance in the case of the splenic flexure.

If the growth involves the upper part of the ascending colon, the hepatic flexure, and the first part of the transverse colon, to remove the lymphatic area it would be necessary to tie the middle colic artery close to its origin, and to remove the mesocolon from this point up to the bowel. Since this cuts off the direct blood-supply to the upper part of the ascending colon and to about two-thirds of the transverse colon, the gut must be excised from the middle of the ascending colon to beyond the middle of the transverse colon. Since an anastomosis of divided ends is then impossible the necessary procedure would be the removal of the lower part of the descending colon, the cecum, and the terminal six inches of the ileum, the ileum then being anastomosed with the remaining portion of the transverse colon. This procedure, though theoretically formidable, is probably no more dangerous than a local excision of the hepatic flexure with end-to-end anastomosis of the colon. Indeed the free mobilization of the part permits free blood-supply.

When the middle of the transverse colon is involved only as much of the gut need be removed as will secure perfectly normal ends for anastomosis. Thus will be removed the paracolic glands, in which the infection is likely to be caught. In involvement of the splenic flexure, together with the primary growth, the left colic artery should be taken away. The method suggested for performing this operation is as follows: The left colic artery is defined as it leaves the inferior mesenteric vein and is tied at this point with the accompanying vein. The bowel is then freed by incising the peritoneum to the outer side of the ascending colon and splenic flexure and separating the bowel, with the growth, the peritoneum, and the subperitoneal tissues containing the lymphatic glands and vessels, from the posterior abdominal wall. The peritoneum is then divided from the point of ligature of the artery upward to a selected point on the transverse colon, usu-

ally at the middle and left thirds of this portion of the gut. When the descending colon is involved the left colic artery is tied at the point where it leaves the inferior mesenteric vein, and also the first sigmoid artery close to its origin. With the sigmoid flexure involved in the first part of the rectum, it is absolutely necessary to ligate the inferior mesenteric artery at some point, since it runs too close to the growth to permit of its preservation. The apex of the wedge of tissue to be removed will therefore lie on the inferior mesenteric artery just below the left colic. The base is formed by the gut, and the intervening tissue include the inferior mesenteric artery, the lower sigmoid arteries, and the lymphatic vessels and subperitoneal tissue in which they lie.

The determination of the amount of gut to be removed by section is based not so much on the principle of going wide of the growth as in a careful consideration of the blood-supply. The vitality of the lower segment will depend on the middle and inferior hemorrhoidal arteries and branches of the sacral arteries. There is not yet enough proof to show that these are sufficient to permit the retention of a length of the rectum necessary for the performance of an anastomosis. The operation consists in exposing the inferior mesenteric artery and ligaturing it and the vein just below the point of origin of the left colic artery. A long incision through the peritoneum is made on the outer side of the mesorectum and mesosigmoid, and the descending colon and gut mobilized by stripping it inward toward the middle line. In doing this the ureter and the spermatic vessels will be encountered and must be avoided. The mesosigmoid is then divided in an oblique line downward from the point of ligature of the inferior mesenteric to about the middle of the sigmoid flexure, care being taken to preserve as far as possible the secondary arches of the sigmoid arteries. The peritoneum to the inner side of the artery is then divided downward to the inner side of the mesorectum. The mass of tissue to be removed is then stripped forward from the upper part of the sacral hollow, and the gut clamped and divided at the middle of the sigmoid flexure and at the junction of the first and second parts of the rectum. The part removed will consist of the lower half of the sigmoid flexure and the upper part of the rectum, the greater part of the inferior mesenteric vessels, with the accompanying chain of glands and lymph-vessels, and the surrounding subperitoneal tissues. The blood-supply of the lower segment is tested by releasing the clamp to see if the cut edge of the rectum bleeds freely. If it does the operation may be terminated by anastomosis. To do this it may be needful to have mobilized the descending colon or even the splenic flexure. If the blood-supply of the lower segment is insufficient either colostomy may be performed, and this is probably safer, or the rectum may be cut further down, even as low as the levator ani, and the anastomosis completed by everting the rectum through the anus, pulling the sigmoid flexure out through the everted rectum and uniting the gut ends by Maunsell's method.

When the growth is in the middle and upper part of the sigmoid flexure the gut is divided as in the preceding operation, with the difference that more of the mesosigmoid is removed and gut divided above at the junction of the descending colon and the sigmoid flexure. The inferior mesenteric vessels are exposed, and the peritoneum is divided over them and stripped off, as many of the main groups as possible being removed without damaging the vessels. This is done from the point of origin of the left colic artery down to the origin of the lowest sigmoid artery. The sigmoid arteries are tied at their origin, the lowest being preserved if its removal be not necessitated by the position of the growth. The descending colon is then mobilized and the gut divided above at the junction of the descending colon and the flexure, and below in the lower part of the flexure. Almost the whole of the mesosigmoid will thus be removed, including the intermediate, paracolic, and epicolic glands, and probably the greater

number of the main group glands corresponding to this part of the sigmoid flexure. The operation is terminated by an anastomosis between the end of the descending colon and the lowest part of the sigmoid flexure. If it is found necessary to tie the lowest sigmoid artery at its origin care must be taken to divide the gut below the level of the brim of the pelvis, in order to avoid the "dead end," owing to the non-anastomosis of the branches of the lowest sigmoid and the superior hemorrhoidal arteries.

ERRORS IN URETHRA AND BLADDER TREATMENT.

PEDERSEN (*New York Medical Journal,* May 1, 1909) thus summarizes the common errors in the treatment of the urethra and bladder.

Under errors of omission may be grouped: Neglect of a prostatitis or seminal vesiculitis, or both; neglect of the patient's general condition; failure to insist upon sexual hygiene; failure to regulate his habits as to alcoholics, tobacco, and coffee; inattention to the dietary and the quantity of water drunk.

Under errors of commission may be placed: The use of the sound in the face of contraindications; overfrequent dilatation and overdilatation; the unscientific use of urethral irrigations in general (in particular, the use of intravesical irrigations before the chronic stage of a urethritis); the use of strong, *i.e.,* caustic, injections and instillations; the sudden emptying of a chronically overdistended bladder; the administration of methylene blue except as a placebo; and, finally, the use of undistilled water in making up a solution of silver nitrate.

PROCIDENTIA RECTI—TREATMENT BY EXCISION.

CUNNINGHAM (*Annals of Surgery,* May, 1909) reports his method, based on a satisfactory experience in three cases. If ulcerations exist upon the prolapsed mass, or if the mass is acutely inflamed, treatment should be directed toward the improvement of these conditions before the operation is undertaken. The same is true of foul vaginal secretions and of certain cases of eczema of the buttocks. A light diet and purging of the bowels should be instituted at least two days before the operation, so that the bowel will be free from contents. Just before coming to the operating table, the lower bowel should receive a copious irrigation of four-per-cent boric acid solution, which should be made to return. The vagina should be flushed in a similar manner.

The patient is placed in the lithotomy position, with the buttocks well over the end of the table. The protruding mass and the surrounding parts should be made clean by soap and water and alcohol. The vagina should be packed with sterile gauze.

The protruding mass should be covered with sterile gauze and drawn outward. The rectal sphincters are usually so dilated that they cannot be defined. An incision should be made with a knife at a point three-quarters of an inch from, and parallel with, the anal margin. This incision will usually be beyond the internal sphincter. It should be carried through all the layers of the gut, thus opening into the pocket of peritoneum beneath. A pair of scissors should now be made to continue this incision around the whole circumference of the protruding mass. The edges should be widely retracted, as a loop of intestine may be within the peritoneal pouch. If so, it should be forced back into the abdomen before the cut is continued.

After this incision is completed, the outer layer of the protruding mass may be rolled inward by pulling the cut edge outward and rolling the mucous membrane surface inward, thus doubling the length of the protruding gut. The gut should be drawn outward until taut, and a clamp with flexible jaws should be placed as high as possible. The hemorrhage from the cut end of the intestine will thus be arrested. The hemorrhage from the cut end of intestine about the anal margin is usually an ooze; if, however, there are bleeding vessels in it they should be snapped, but not tied. The protruding gut should be turned upward and

the mesentery of the rectum inspected. Vessels which bleed considerably and which require ligation will usually be found. It is important to control all hemorrhage from the mesentery, as intra-abdominal hemorrhage will otherwise result, following the completion of the operation. The gut having been drawn outward until taut, the clamp having been placed on the gut as high as possible, and the hemorrhage having been controlled, the distal portion of the gut is removed by a knife about one-half inch beyond the clamp.

It remains now to unite the cut edges of the distal portion of gut beyond the clamp to the proximal portion surrounding the anus. This has been done by a buttonhole stitch of No. 2 chromic catgut, each stitch being made to include at least a quarter of an inch of each cut portion of gut. This stitch is made to unite all the layers of the cut ends until the clamp is reached. The clamp is then removed, and the small space previously occupied by it is included in the sutures. The end of the suture is then tied to the end made by the first knot, and the union is complete. The hemorrhage from the cut gut is controlled by the buttonhole suture.

A piece of rubber tubing four inches long is surrounded by iodoform gauze and made sufficiently large to fill the gut entirely, at the point of suture. This is placed within the gut, its passage being facilitated by smearing it with boric acid ointment. The packing is removed from the vagina and iodoform gauze replaced. A self-retaining catheter may be placed in the bladder and siphon drainage established if it is deemed best. A suitable dressing should be applied to the perineum.

The patient should be kept on a light diet, and pil. opii gr. j should be given night and morning to prevent the bowels from moving. If siphon drainage of the bladder is not employed, the patient should be catheterized at regular intervals for several days. The rectal plug should be left in position for a week, providing the local condition remains satisfactory. After the plug is removed the rectum should be irrigated with four-per-cent boric acid solution by means of a glass syringe, the amount being never more than 2 ounces at a time for fear of causing a desire to evacuate the fluid. With each injection the fluid should be sucked out. After the bowel is thus cleansed, one-half ounce of iodoform emulsion should be injected and allowed to remain. This procedure should be performed once daily, provided the local condition remains clean. If it is not clean, the procedure should be practiced several times daily. It is desirable to prevent the bowels from moving for ten days unless symptoms arise which necessitate a movement before this time. If so, 4 ounces of oil should be injected into the rectum to soften the fecal masses, and a purge administered. After the movement the iodoform emulsion should be injected.

The patient should remain under observation for a year or two in order to detect any contraction at the point of suture. If this contraction is detected the constriction should be dilated by rectal bougies.

NOMA—SEVEN CASES; TWO RECOVERIES; FORTY INFECTED.

Crandon, Place, and Brown (*Boston Medical and Surgical Journal*, April 15, 1909) report an outbreak of noma occurring in a crowded institution and following measles. Forty-six children showed gangrenous stomatitis with foul breath, and of this number six exhibited definite gangrene of the lip or cheek. A seventh case appeared from another source.

They make the report because they have some good pictures and because two cases got well from definite gangrene, and 40 cases all coming from the same source, exposed to the same conditions and apparently showing the same early stage as the definite cases of noma, did not develop extensive gangrene but got well. The disease is to be looked upon as a rarity even in large clinics. Thus in three years at the Hospital for Children there were six cases in 13,000 admissions. The differential diagnosis between noma and Vincent's angina can be made only as the clinical pro-

cess advances. The shallow ulceration with grayish adherent membrane containing a pure culture of bacillus fusiformis and spirochæta with only a slight reaction is the same for each. The edema, the early and rapid increase serve to differentiate. The necrosis-producing power of bacillus fusiformis is well proven, and its etiological relation to Vincent's angina is now generally accepted.

As to prognosis of noma, the duration is from four to ten days; the mortality is about 70 per cent. When perforation has appeared even radical treatment will afford no relief.

Hygiene, both general and oral, is of the greatest importance in prevention. Of the forty suspects all showed an ulcerative condition of the gums, or a gangrenous odor to the breath, or carious teeth, or all three. The constant finding of B. fusiformis in carious teeth, and clinical evidence of the process of gangrene beginning at site of bad teeth point the way to prevention. Ulcerative stomatitis and gangrenous stomatitis represent different stages of the same process. In all infectious diseases, particular care must be given to the mouth, cleansing at least three times a day with some mild antiseptic solution. The fact that B. fusiformis is anaerobic suggests that hydrogen peroxide might be of value. This is borne out by the authors' experience. Cleansing of the mouth must be continued even after noma develops, since in all their cases the immediate cause of death was inhalation pneumonia. In the cases in the ulcerative stage chromic acid in from 2- to 10-per-cent solution has arrested the process if painted on early and used twice a day following thorough application of hydrogen peroxide.

After necrosis is well started the application of the actual cautery under chloroform anesthesia will arrest the process if thoroughly done, meaning by this penetration into healthy tissue. If the process is extensive the blackened area should be excised with a knife first and the cautery applied to the bleeding edge.

Liquid nourishment and soft solids, including ice cream, are to be given. The most important of all in general treatment is to keep the patient out-of-doors, this not only because of its general tonic effect, but because it diminishes the chance of pneumonia, the usual direct cause of noma.

Noma is not proved to be a contagious disease, and need not be isolated. Any uncared-for mouth, particularly in a sick child, and especially after measles, may contain B. fusiformis and spirochæta gracilis. In such a mouth these organisms may be found without ulceration, or in the lesions which have been described as stomatitis gangrenosa, Vincent's angima, and noma. The lesions, in other words, may be only round the roots of teeth, on the tonsils and pillars, on the inner sides of the cheek, in the nasal fossæ, on the external ear, and about the genitals. Any of these conditions, including the extensive gangrene and sloughing of so-called noma, may be different stages of the same disease, which may be therefore considered as not necessarily a specific disease, but the successful ingress of mouth bacteria into tissues rendered non-resistant by uncleanliness and preceding disease.

SURGICAL TREATMENT OF LOCOMOTOR ATAXIA.

DENSLOW (*Annals of Surgery*, June, 1909) in a further communication on this subject reiterates his opinion that the dystrophic changes that occur in the neurones of the posterior roots and their connections in tabes are the result of continuous sensory impulses conveyed from some peripheral point to the sensory roots in the cord; that such continuous impulses, kept up perhaps for years, exhaust the central nerve substance, which, having no rest or intermission from such impulses, and having no time or opportunity for recuperation, finally succumb from exhaustion and take on dystrophic degeneration. The changes found in situations other than the cerebrospinal, such as the sympathetic and peripheral nerves, are probably due to the force of the sensory impulse passing on through their spinal connections, and expending

their force at the points of least resistance; as, for example, their terminations in the skin and muscles, and in the ganglia of the sympathetic.

Professor Mathews of the Leland Stanford University has made observations that may explain the manner in which the dystrophic change takes place, and it certainly accords with the present theory. It is known that the conducting nerve substance, or neurone, is a very simple tissue, almost protoplasmic, being a little more than highly phosphorized fats in a weak saline solution. In other words, this portion of the nerve consists of colloid particles in suspension. Professor Mathews found that when a nerve is stimulated electrically the colloid particles of these fats are precipitated, and that coagulation to a certain extent takes place.

It has also been proven that the effect of fatigue (either natural or artificial through electrical stimulation) is shown by histological changes, characterized by shrinkage of the nerve cell. In the resting condition these cells are turgid with large round nuclei, whereas fatigued cells are vacuolated and shrunken, with corresponding changes in the nuclei. It has been found that the amount of shrinkage increases in geometrical ratio to the length of time during which the stimulus has been allowed to act. This would seem additional evidence that nerve impulses can, as the result of incessant irritation, produce the change which takes place.

According to the views advanced by Edinger the fatigue or exhaustion induced by overwork of a healthy nerve may never be recovered from, so that the outcome is paralysis and atrophy.

Syphilis is no doubt a prime factor in tabes, but only so far, probably, as it is responsible for a tissue condition necessary to render such tissue more susceptible to the continuous sensory explosions or impulses; it is certain that other causes that have been supposed to be direct factors in the etiology of tabes, such as exposure to cold, overexertion, and alcoholism, are only so in so far as they lower the resisting power of the system in general and the nerve centers in particular. Sexual excesses have a direct bearing when the irritation is in the genital tract, by aggravating and perpetuating the points of irritation.

Many cases of tabes, other than those preceded by syphilis, are directly caused or rather precipitated by some injury or shock. In all cases where such injury or shock appeared to be the starting-point of the disease there are found to be urethral lesions which had evidently existed for a long time. In these cases the spinal cord was able under normal conditions to defend itself against this irritation; but after the shock consequent upon the injury, the cord apparently at once succumbed to the influences from the urethra.

The initial irritation, it is believed, may be in the urethra, bladder, and rectum of both sexes, and also in the uterus and appendices in the female. Eye-strain and intestinal putrefaction are certainly factors that must not be overlooked when searching for the initial peripheral irritation. The well-known astigmatism due to ataxia of the ocular muscles, in cases of tabes, frequently is corrected upon the relief of the peripheral irritation. It is interesting to note in connection with rectal irritation that a prominent Boston surgeon has reported to Denslow the case of a woman in whom great improvement in her ataxic gait took place immediately following a rectal operation, although at the time of the operation there was no intention of relieving the tabes, the operation being done solely for relief of the rectal irritation.

Denslow reports a number of highly suggestive cases in which the peripheral irritation was found to be situated in the urethra and bladder, and the lesions found varied from slight local to general irritability, with erosions, with and without contractions, and simple irritation of the bladder with or without incontinence of the urine and feces or both.

The first essential is to clear the urethra of all contractions, operating and dilating whenever necessary, and to treat locally per urethroscope any erosions or sensitive con-

ditions, whether local or general. Denslow formulates certain conclusions, which follow:

That peripheral irritation can produce pathological change in the central nervous system by creating continuous nerve impulses which exhaust the substance of its nerve centers.

That the peripheral nerve degenerations of tabes are probably due to the same impulses carried on past the central system, expending its force upon the points of greatest vulnerability or least resistance.

That symptoms occur in certain cases of tabes with a severity out of all proportion to the actual pathological change that has taken place in the nerve centers, and that such symptoms are caused by the initial change creating a zone or aura of irritability beyond such change, which extends to the cerebrum, cerebellum, and sympathetic, and at times appears to cover almost the entire nervous system, including that of nutrition.

That removal of this causal irritation resulting in recovery from such grave symptoms, as loss of balance, ataxia, incontinence of urine and feces, anesthesia and hyperesthesia, etc., would appear to indicate the existence of such zone of functional irritability beyond the actual pathological change.

SURGICAL TREATMENT IN TUBERCULOSIS OF THE EPIDIDYMIS AND TESTICLES.

CUMSTON (*Annals of Surgery*, June, 1909) notes that tuberculosis of the epididymis, with or without involvement of the seminal gland, is a distinct type of local tuberculosis, and attacks patients who otherwise exhibit a state of perfect general health and who may never present any other tuberculous lesion. Nor is the dictum true that tuberculosis of the testicle will necessarily sooner or later extend to other organs. Many cases of genital tuberculosis develop and run through their clinical courses without involving any other organ, and they frequently present a tendency to spontaneous cure, this being the result of defensive reaction of the tissues. The tuberculous lesions arising in the testicle of the adult commence always in the epididymis, but the infection does not necessarily remain localized to this structure and often the testicle is involved at the same time. Reclus observes that out of 68 autopsies both the epididymis and testicle were involved in 48 subjects, the epididymis alone in 20.

On the clinical side, however, it is demonstrated that only in about 33 per cent of the patients is the testicle involved. From the clinical point of view the disease may appear in two very different aspects: in the first, which corresponds to the period of development of the tubercles, a swelling formed by one or several hard foci is felt, while more or less pain is elicited by pressure. In other cases the entire epididymis is involved and may reach two or three times its normal size, while the seminal gland itself is normal to the feel and not enlarged. The functional disturbances, usually absent, are those symptoms arising in the bladder and prostate: these being frequent desire to urinate, a mild degree of vesical tenesmus, slight hematuria, a seropurulent urethral secretion, etc. These symptoms would seem to indicate an early participation of the prostate in the infection, and if rectal examination is made at this time tuberculous nodules can usually be felt in the prostate and seminal vesicles. During this period the tissues subjacent to the testicle present no changes. Only a slight hydrocele occasionally indicates a reaction in the vaginalis. Suppuration is usually indicated by pain and increase of swelling.

In spite of several fistulæ and the persistence of suppuration the lesion may remain localized in the epididymis. Since the epididymis is already obliterated its removal can do no further harm. It may be regarded as a miniature pus tube and should be cleanly taken out. The incision should be made on the anterior aspect of the scrotum to the extent of two or three inches and should include all the structures comprising the vaginalis, so that the testicle is freely exposed. For the purpose of exploring this gland it is split open and thoroughly

examined. When found healthy it is sutured with fine non-chromicized catgut. Operation on the epididymis is then undertaken. This should be taken out; all that is necessary is to incise the vaginalis both inwardly and outwardly in order to decorticate the organ from the testicle. The vas deferens is cut, but care must be taken in doing this not to injure the internal branch of the spermatic artery. Consequently one should nick the vaginalis at the internal aspect of the head of the epididymis, and the vas deferens having been cut the epididymis is drawn upward and simply peeled off from the vascular mass. When this is done the epididymis is simply retained by a few small vessels, the vas deferens, and cellular tissue. The ligature having been applied to this mass a stroke of the scissors completely frees the organ.

Cigarette drainage is employed for one to two days. If the body of Highmore looks suspicious after the epididymis has been removed it should also be excised. If the vas deferens shows evidence of disease it must be resected up as far as possible. It may be followed down into the pelvis. In those cases in which the epididymis is adherent to the posterior aspect of the scrotum, or if an abscess has opened in this region, the organ should be reached at this point instead of by an anterior incision. If necessary the diseased skin and structures may be resected. The fistula is likewise incised freely in order to avoid dissemination of the infection during epididymectomy.

Curettage and cauterization may be resorted to in cases of recurrence, but if these fail to control the process, if fistulæ persist, the testicle must be sacrificed in order to do away with prolonged suppuration. Under such circumstances the earlier radical interference is undertaken the better it will be for the patient's general health. There is also a general feeling to the effect that patients who present advanced pulmonary lesions should be castrated because the local lesions in the genital apparatus will have no tendency to disappear after a conservative operation, and these subjects cannot stand the debilitating effects of a prolonged suppurating process.

In the acute type of tuberculosis of the epididymis and testicle the characteristic is the intensity of the symptoms presented at the commencement of the process. The symptoms closely resemble those of gonorrheal epididymitis, excepting that in the beginning the prostate and seminal vesicles are normal. In a few days the acute symptoms disappear, the subsequent course of the affection then resembling that of chronic type, excepting that the suppuration inevitably and quickly follows.

In the treatment of these acute cases Cumston strongly advises castration.

TUBERCULAR PERITONITIS.

BROUN (*American Journal of Obstetrics and Diseases of Women and Children,* May, 1909) after calling attention to the fact that primary tuberculosis of the peritoneum is extremely rare, the infection being received through the intestinal tract, or, in women, through the Fallopian tubes, alludes to the insidious onset of the affection, though at times the cases commence suddenly with symptoms of acute pain and tenderness simulating cases of appendicitis or acute pelvic inflammation, followed shortly by pronounced ascites.

Ochsner is quoted to the effect that fully 50 per cent of the cases of tuberculous peritonitis recover in the hands of the physician. Strapping the abdomen is suggested as an efficient means of increasing thoracic respiration and thus exaggerating lymphatic absorption. The most important medical treatment is regarded as incident to the use of tuberculin. The time to operate is after effusion has become chronic. Shattuck is quoted to the effect that four to six weeks should elapse before surgical measures are instituted. The cases most favorable for surgical intervention are those of a serous type without adhesions, also in localized collections of fluid. Yet no classes seem to be at times beyond the beneficial influence of surgery.

Wunderlich's statistics are quoted to the

effect that 23 per cent of the ascitic form are cured, 9.8 per cent of the fibroadhesive form, and that all exhibiting the ulcerative form perish.

Leuret's conclusions are indorsed. These are as follows:

Genital lesions are the most frequent cause of peritoneal tuberculosis in women, in particular, the clinical type known as idiopathic ascites in young women.

Tuberculosis of the adnexa is always accompanied by tubercular peritonitis, the form occurring being one of two types—ascitic peritonitis, free or encysted, and dry pelvic peritonitis with adhesions.

The type of pelvic peritonitis with adhesions is subject to frequent exacerbations.

Mayo stated that he has had no recurrence of the ascitic type after removal of the tubes, whilst Murphy states that the only treatment is complete extirpation of the tubes. The abdominal route is preferable. Moreover, the appendix should be examined and removed in every instance when any suspicion may exist that it is the focus. All writers warn against extensive separation of agglutinated intestines, pointing out that the especial danger in this class of cases is incident to the intestinal walls being usually much infiltrated and easily torn. After abdominal section the wound should be closed and drainage discarded.

THE TREATMENT OF INOPERABLE CANCER OF THE UTERUS.

GELLHORN (*American Journal of Obstetrics and Diseases of Women and Children*, May, 1909) observes that the treatment of so-called operable cases of uterine cancer seems, for the present, to have reached a certain degree of technical perfection, whilst a patient with inoperable cancer can derive but little advantage from the labors and advances of special workers. The treatment which Gellhorn advocates is the application of acetone, a transparent, colorless, volatile liquid of a characteristic ethereal odor and a pungent, sweetish taste.

The treatment should always be preceded by a thorough excochleation of the ulcerating area, because the penetrating power of the acetone would be uselessly spent in hardening any dead necrotic tissue. The curetted cavity or crater is then carefully dried with cotton sponges, and from one-half to one ounce of pure acetone is poured into the wound through a Ferguson or other tubular speculum. For this purpose the pelvis of the patient must be raised as in Trendelenburg's position. The narcosis may now be interrupted and the patient be left in this position for from fifteen to thirty minutes. Next the acetone is permitted to run out through the speculum by lowering the pelvis of the patient, and the cavity is packed with a narrow strip of gauze soaked in acetone. The healthy mucosa of the vagina and the vulva are cleansed with sterile water and dried, and a cotton tampon is inserted into the vagina to absorb any excess of acetone.

After this preliminary curettage and first application the regular treatment, which requires no further hospital care, is administered twice or three times a week, beginning the fourth or fifth day after the operation. This is done without narcosis, and may be given with the patient in bed or on the ordinary examining chair or table in the office. The pelvis of the patient is raised and the tubular speculum is inserted into the cancerous cavity. With the progressive diminution of the crater, smaller specula are gradually employed. The speculum is filled with acetone and held in place by the patient's hand for half an hour, and is then emptied in the manner as described above.

Care should be taken to prevent the acetone from running over the vulva or perineum. The writer overcomes this difficulty by applying a thick layer of ordinary vaselin to the vulva and lower third of the vagina; the outside of the speculum, too, is well covered with this vaselin; and after the acetone has run out of the speculum the cavity is swabbed dry and a large cotton tampon coated with vaselin is introduced into the vagina before the speculum is withdrawn. This tampon may be removed by the patient after a few hours.

The immediate effect of this simple pro-

cedure is to at once check slight oozing. The surface of the crater is covered with a whitish film. Wherever there is an extravasation of blood the discoloration is light brown. The normal vagina is not appreciably irritated. On the vulvar mucosa and the outer skin an excess of acetone produces a faintly white discoloration, which soon disappears. There is no pain from the application save an intense burning sensation if the necessary precaution has not been observed and the acetone has touched the vulva. This, however, passes away rapidly if the affected parts be washed with cool water.

The more remote effect manifests itself in a marked reduction of the intense odor. The discharge at first becomes more watery and gradually disappears. With it disappears the former stench. At the same time the hemorrhages fail to recur. After two or three weeks of treatment there is a considerable diminution in the extent of the wound cavity.

The general somatic condition of the patient improves visibly. Pain is not materially relieved.

LIGATION OF THE EXTERNAL CAROTIDS.

Fisk (*Annals of Surgery,* June, 1909) alludes to the high mortality incident to ligation of the common carotid artery—*i.e.,* 31 per cent in 314 operations and 26 per cent exhibiting cerebral symptoms. Senger's and Schoenboern's suggestion of temporary closure of the common carotid is alluded to, together with Crile's experimental and clinical research of a later date. Of 30 cases of ligation of the external carotid collected from the literature there is but a single instance of secondary hemorrhage. Dawbarn is quoted to the effect that excision of the external carotid is a surprisingly safe operation, to which there should be attached scarcely any mortality, surely not more than one per cent. Fisk considers the ligation of the external carotid as a safe and wise procedure in operations on the neck and face, especially in operations for the removal of malignant disease of the bones and as a palliative measure for the relief of pain where the disease cannot be removed.

The origin of the ascending pharyngeal must be ascertained, and if at the bifurcation of the common carotid, it must be ligated also.

THYROID GLAND VASCULAR SURGERY.

Carrel (*Surgery, Gynecology and Obstetrics,* June, 1909) concludes an article on the subject as follows:

Among the vascular operations able to modify the functions of the thyroid, the ligature of the arteries alone has been used in clinical surgery for the treatment of exophthalmic goitre. Other disease of the thyroid, especially the "formes frustes" of hyperthyroidism and hypothyroidism, may be improved by surgical modifications of the circulation of the gland. It is very logical to suppose that we can stimulate or diminish the activity of a gland by increasing or diminishing its circulation, and perhaps also modify its pathological reactions. But it is premature to think at present of clinical applications along these lines. The study of the question is still at its beginning, and a great many of more precise experiments have yet to be done.

The treatment of hypothyroidism and athyroidism by transplantation of the thyroid is more immediately promising of practical results. The feasibility of the operation has been already demonstrated. The actual problem is to render it ordinarily successful. Success in transplantation depends on two factors, biological and surgical. We are still ignorant of the biological factors of success and failure in transplantation of tissues between animals of same species. We do not know exactly what are the interactions of the organism and its new organ. It is certain that, at least in some cases, the gland adapts itself to its new owner, does not undergo any marked histological changes, and functionates normally. But we do not know how frequent are the cases in which the new tissue and its host will have a pernicious influence on each

other. The surgical factors can be probably controlled. It must be hoped that the technique of the graft by simple implantation will be improved. The operation is very much simpler than the transplantation with anastomoses of the vessels. However, if it is found that it cannot be frequently successful, the transplantation of large pieces of thyroid with union of their vessels to the vessels of the patient must be attempted. In this indirect manner vascular surgery may improve the results of the treatment of hypothyroidism and athyroidism.

In regard to the explanation of the failure of grafts Carrel states that it is chiefly in the technique followed by the surgeons. A small piece of thyroid if exposed to the air for two minutes dies. A fluid which is not isotonic, or which contains toxic ions, kills the thyroid tissue in a short time. A small piece of thyroid which has been placed in an isotonic solution of sodium chloride for ten minutes does not take when grafted. Locke or Ringer solution must be used. The best fluid is serum from an animal of the same species, or inactivated serum from an animal of different species. Cristiani has shown that a piece of gland preserved for about one hour in serum is still living. It is probable that in many operations the graft was already dead when the surgeon placed it into the tissues of the patient.

If the transplanted piece is small, the area of central necrosis is comparatively much smaller than in a larger graft. By using very small pieces of tissue Carrel observed that sometimes central necrosis does not occur at all. Cristiani advises a graft the size of a seed of wheat. It is certainly better to make many small grafts than a large one. When the graft is too large central necrosis is extensive, and after a few weeks the transplanted piece is often replaced by connective tissue.

The reëstablishment of the circulation through the graft depends on its relations with the surrounding tissues. The new tissues receive their vessels from the host. New vessels can be seen penetrating into the graft on the third or fourth day after the operation. If there is dead space around the transplanted tissue the vessels cannot reach it, and the graft does not take. Therefore the location of the transplantation must be carefully chosen. The spleen is far from ideal, since it is impossible to obtain perfect hemostasis of the wound. By transplanting the thyroid substance into the bone-marrow; and by operating in two stages, Kocher is able to graft the thyroid into a very vascular tissue without danger of hemorrhage. But it is probable that the graft is soon surrounded by dense connective tissue. It is certainly better not to irritate so much the tissues of the host, and after having selected a region, the hemostasis of which can easily be obtained, to operate in one stage. The subcutaneous connective tissue appears to be the best location.

It is probable that in spite of a perfect technique the graft can fail. The transplanted tissue may be destroyed by the serum of the patient, as it happens in heteroplastic transplantations of the thyroid gland, when the zoölogical distance of the animals is very marked. But this cytolysis is doubtless exceptional in homoplastic transplantation. The disappearance of the graft may be due also in some cases to its inability to secure for itself a sufficient blood supply.

The transplantation of the thyroid with anastomoses of its vessels to the vessels of its host is a safer method. The whole gland can be grafted. Its circulation is immediately reëstablished and probably also its functions. The feasibility of this operation depends entirely on the development of vascular surgery. Carrel states that in 1905 he extirpated with Guthrie the right thyroid of a dog and replaced it into his neck. The vessels were anastomosed and the circulation was reëstablished about half an hour after extirpation. The red blood entered the gland through the thyroid vein, and the dark blood flowed from the gland to the jugular vein through the thyroid artery. Eleven days after the operation the wound was opened and the anterior portion of the gland directly observed. Its color

and consistency were normal. Eight months after the operation the gland was normal in size and consistency. It was very superficially located and progressively it became much deeper. Twelve months afterward it was about in its normal situation. The dog was then sent to the country. The experiment showed that the reëstablishment of the circulation was possible and that no necrosis occurred.

Stich has demonstrated that the thyroid gland can remain for one and a half hours and be successfully transplanted. Carrel states that the homoplastic transplantation of the gland is possible by the method of implantation.

The second method is still in the experimental stage. It is noted that Cristiani and Charrin, in a case of exophthalmic goitre, performed a complete thyroidectomy, after which symptoms of myxedema developed. Then they transplanted into the subcutaneous connective tissue thirty-eight very small pieces of normal thyroid gland. The grafts took and no accident occurred. Three years after the operation histological examination of the transplanted parts showed that they were in excellent condition.

Mayo, writing on the operative treatment of hyperthyroidism (*Surgery, Gynecology and Obstetrics,* June, 1909), prefers the term hyperthyroidism to exophthalmic goitre, since many of the patients do not have a goitre and others do not have the prominent eye, whilst others do not have either of these symptoms in the early stages of the disease. The diagnosis might be made if these symptoms were not considered of so much importance. The essential feature of the condition is that the whole of the gland or only a part shows an overactivity from the cell changes. The cells are increased, there being more of them in the vesicles, or more vesicles. There is an overproduction of secretion. The most active condition of hyperthyroidism does not necessarily require the presence of a large tumor or goitre since after the gland has doubled its size the greater increase usually consists of colloid, a retention complement change occurring in the secretions retained in the vesicles.

The symptoms of goitre are caused by a thin non-stainable secretion, the iodothyroglobulin, which leaves the gland probably by way of the lymphatics. Two prominent symptoms, tachycardia and tremor, if appearing without other marked symptoms, must be differentiated in middle life from myocarditis. Protrusion of the eyes may be real or apparent; widening of the palpebral fissure, lagging of the upper lid on looking down and the lower on looking up, diplopia for near work and sudden recession of the lids when fixing the eyes upon a near point, are symptoms peculiar to this condition. There is often marked muscular relaxation, a condition of chronic exhaustion, twitching, gastric crisis, and attacks of persistent vomiting. The intestinal symptoms are those of relaxation, diarrhea, or loose bowel movement, with but little increase in the total quantity passed. There is usually capillary congestion, ultimately dilated heart and irregularity of rhythm and tension, due to degeneration of the muscle. This degeneration includes the liver, spleen, and kidneys. Incomplete contracture and imperfectly closed valves cause venous pulse and low blood-pressure. The skin sweats readily and later becomes pigmented. Hyperthyroidism may begin in early childhood, Mayo having performed a thyroidectomy in a child aged seven. Unilateral exophthalmic goitre is that variety caused by the stimulus of an encapsulated adenoma growing in the lobe of the thyroid, which later causes pressure absorption of the gland, with attacks of intermittent hyperthyroidism, and in which all the symptoms occur except that of proptosis.

Reduction of the blood supply of the gland or removal of a varying quantity of its substance represents the accepted method of treatment. In patients seen in the early stage of the disease in whom thyroidectomy is not justifiable, the ligation of the superior thyroid arteries and veins on both sides seems to bring about a rapid cure. Nor is this method subject to the danger of hyperthyroidism from removal of the gland. It can be followed later by the removal of a

portion of the gland. In about two-thirds of the cases seen by the surgeon, the operation for the removal of the larger lobe and isthmus can be undertaken without undue risk. In at least one-fourth of the cases the condition is so extreme from the continued toxic condition or from acute exacerbation that the ligation of the vessels is advisable as a preliminary procedure. In a few such cases the results are astonishing. There is relief from all symptoms and an increase in health and strength within a few months, and should thyroidectomy be then undertaken it can be done with much less risk than the former procedure of ligation. These operations Mayo designates the graduated operations for hyperthyroidism.

The patients who have developed the symptoms of Graves's disease upon a previously existing goitre are usually fair risks for the operation of thyroidectomy. The condition designated as unilateral exophthalmic goitre is also readily treated by enucleation of the offending or encapsulated adenoma. Myxedema, or hyperthyroidism, may be treated by the removal of the gland to the discredit of the surgeon, since the gland is already lacking in secretion.

Mayo thus describes his operative technique:

A transverse incision is made in a skin crease crossing the thyroid cartilage, and the wound is deepened to the gland between the omohyoid and the sternomastoid muscles. All of the branches of the superior thyroid artery are secured at the apex of the lobe in one mass ligature which includes the superior veins as well, and in some cases a bit of the upper pole of the gland. The ligature material is linen.

The incision for enucleation and excision is the transverse collar or Kocher incision. The incision is best placed midway between the thyroid cartilage and the sternum. The incision includes the platysma-myoides muscles, which is lifted above and below with the skin flap over an area sufficient to expose the muscles covering the enlarged gland. A vertical incision now separates the hyoid muscles from the thyroid cartilage to the sternum. In cases of adenoma to be enucleated, the fibrous capsule is now opened, the goitre exposed and incised to the depth of the adenoma capsule, which is enucleated, and the thyroid tissue closed with a locking buttonhole stitch. A temporary drain of rubber tissue relieves the tension which might occur without this provision. The wound is closed with the subcutaneous suture.

In case excision is deemed best, the sternohyoid is caught and cut between the forceps near its upper insertion, which would be above the nerve supply. If more room is required in order to expose the upper pole and facilitate the ligation of the superior thyroid artery, the sternothyroid may be treated in a similar manner. This trap-door exposure aids greatly in the elevation of the gland, which is now incised along its outer border with the dissecting scissors and the tissues brushed down with gauze as the gland is dissected. The vessels as seen are caught in artery clamps. This capsule is not readily removed, as it is bound to the gland at many points by the trabeculæ of connective tissue which penetrate the gland. The inferior thyroid artery may, at times, be caught before it reaches the capsule. The gland is rotated over the midline of the neck, preserving the capsule and deeper tissues, recurrent laryngeal nerves, and parathyroid glands from injury. There seems to be but little danger from rough handling of the gland removed if the portion which is to remain is preserved from injury.

The severed muscles are united and the wound drained with spread-rubber tissue over the raw surface of the thyroid, and a tubular drain is often employed for twenty-four hours. The wound is closed as previously described.

The parathyroid bodies are four in number, as a rule, and they rest two on each side behind, or they may occasionally be connected with the capsule of the gland. These bodies should be preserved to prevent tetany, and yet it is less probable that the injury of two of them in the removal of one lobe for exophthalmic goitre would produce tetany, than that the disease would

follow a similar operation for simple colloid goitre, with a partial removal of the second lobe as a primary or secondary procedure.

The anesthetic of choice is ether. Cocaine infiltration may be substituted if the extremely serious condition of the patient demands it, or if the surgeon prefers it, or lacks confidence in his anesthetist. If ether is used 1/120 grain solution of atropine and 1/6 grain morphine is given hypodermically. These drugs allay the tracheal mucus and act as a stimulus, and reduce the necessity of profound narcosis by quieting the mental distress.

The patient is placed upon a table in the reverse Trendelenburg position, the head thrown back and the shoulders elevated to render the thyroid area more prominent and accessible.

After operation the patient is given one quart of saline slowly per rectum. This is repeated twice within the next twelve hours. Should intestinal relaxation be present, the writers consider the salines of sufficient importance to give them subcutaneously in all severe cases. The precardial ice-bag may steady a rapid heart. Atropine checks excessive perspiration, and morphine quiets restlessness. These drugs are used as indicated above. Death from operation seldom occurs after the first twenty-four hours.

The employment of the graduated operation or the above-described methods of selecting the time, the preparation, and the choice of type of operation, with the careful after-care of the patient, has reduced the mortality from four to two per cent.

A CASE OF BACILLARY INFECTION OF THE URINARY TRACT TREATED BY THE CORRESPONDING SERUM AND VACCINE.

Butler (*Lancet*, June 12, 1909) reports the case of a woman whose major complaint was difficulty in holding urine and scalding pain on passing it. Medical treatment was futile. Bacteriological examination of the urine showed bacillus coli and streptococcus, the latter in much larger numbers. Mixed vaccine of the two organisms was ordered. As the woman was acutely ill a subcutaneous injection of 20 cubic centimeters of the polyvalent antistreptococcus serum was given, without effect. The following morning 20 cubic centimeters more were mixed with normal saline and given as an enema, and repeated in four hours, and again without result. In the evening 25 cubic centimeters of anticoli serum was injected subcutaneously, and in twelve hours the temperature had fallen to nearly normal. The patient felt better, pain over the kidney was lessened, and micturition was less frequent and less painful. Twelve hours later 25 cubic centimeters was given as an enema, without result. The next day 25 cubic centimeters was given subcutaneously. Again there was a drop in temperature and relief of pain and scalding. Twelve days after the onset of the acute illness the mixed vaccine was given and caused a slight rise of temperature. The next injection was given two weeks later, and thereafter at a month's interval. Each injection caused a great deal of local pain and swelling. Evidently the reporter did not consider the ultimate fate of this patient worth recording. The fact of the prompt and pronounced improvement following at least two of his anticolic injections is suggestive.

TREATMENT OF VOLVULUS.

Waterhouse (*British Medical Journal*, May 29, 1909) reports in the course of an address upon volvulus, illustrated by cases occurring in his own experience, one of spontaneous reduction which he states is by no means infrequent, and observes that tenderness is a far more valuable localizing symptom than pain. The latter may be referred; the former corresponds to the situation of the lesion. Distended coils of intestine may exhibit violent peristaltic movement which may be seen to cease abruptly at a definite spot. Local meteorism may enable a diagnosis to be made, and such localizing symptoms are often of real value. Soon the twisted intestine and mesentery undergo venous engorgement and edema, and both exude plastic lymph which may glue the volvulus to adjacent coils of intestine, and thus present a for-

midable obstacle to reduction of the lesion. Not until the vitality of the bowel wall has been so impaired as to permit of its permeation by microbes from inside the strangulated bowel will septic peritonitis commence, but when once started this infective process spreads rapidly and soon becomes diffuse. Extreme intestinal distention is chiefly noted in cases of volvulus and of generalized septic peritonitis. As a point of differential diagnosis, it may be mentioned that tenderness on pressure is far more marked in the latter condition.

The onset of gangrene of the twisted bowel is indicated by the pulse becoming rapidly weak and quick and by the septic appearance of the patient.

A hyper-resonant note may frequently be elicited over the distended volvulus. The diagnosis of volvulus the writer has found far easier in the early stages of the malady than when the characteristic symptoms are concealed in great measure by the general tympanitic distention of the abdomen and the onset of peritonitis. In the diagnosis of volvulus it must be remembered that the onset is very sudden, that the obstruction of the intestine is complete, that the volvulus can often be felt as a tense tumor (resembling an india-rubber ball intensely inflated) which is always tender on pressure, hyper-resonant on percussion, and commonly the seat of pain.

A volvulus that is very recent and in which no secondary changes have occurred in the twisted mesentery may be reduced occasionally spontaneously, and more frequently by the aid of copious rectal enemata, especially if the rotation has only been through half a circle or thereabouts. When, however, the volvulus has been in existence for some time and the rotation corresponds to a complete circle, or more, and when secondary changes have occurred in the mesentery and intestinal loop, then death from obstruction and septic peritonitis, otherwise inevitable, can only be avoided by opening the abdomen and undoing the twist. The more complete the twist and the higher up in the bowel the volvulus, the more urgent is the danger.

The loop of bowel twisted upon its mesenteric axis provokes vigorous peristaltic movements in the intestine above it. The first indication in treatment is to calm this dangerous peristalsis, which tends markedly to aggravate the existing obstruction and strangulation. No food must be given by the mouth.

Should the ejecta consist largely of bile or the contents of the small intestine, it adds greatly to the patient's comfort to wash out the stomach either by the stomach-tube or by giving water freely by the mouth.

The two conditions that make for success in the treatment of volvulus are immediate diagnosis on the part of the practitioner and immediate reduction of the volvulus by the surgeon. Should either of the two fail in his part, the probable result will be the death of the patient.

In very recent volvulus, especially of the omega loop, reduction may be accomplished by rectal enemata in a certain proportion of cases. Should they fail, and this will frequently happen, the surgeon must in every instance open the abdomen. The incision should in every case be made in the linea alba, for the reason that by a median incision every viscus in the abdomen may be examined.

There are few things more distressing than, after making an incision in the left inguinal region for the relief of a sigmoid volvulus, to discover that the cecum has burst owing to overdistention, and that a second incision is called for to deal with this terrible lesion. The abdomen having been opened in the midline the cecum is in all cases of intestinal obstruction to be examined immediately. Its condition at once gives information of great value. In volvulus the cecum itself may be the seat of the lesion. If the cecum be empty the obstruction is obviously in the small intestine; if it be distended, in the large bowel. In all cases of two or three days' standing there will be found marked distention of the intestine above the site of the obstruction. The volvulus owing to its huge size will be readily found, and must if possible be brought outside the abdominal incision. The next step is to replace the twisted

bowel into its usual position. In the majority of cases this reposition is by no means a simple matter. Should the volvulus be of only a few hours' duration the adhesions will be slight or absent. Untwist the strangulated loop in a direction the reverse of that in which the twist occurred and deal gently with it. In the majority of instances the bowel loop will immediately spring back into its former vicious position. Not only must the contents of the volvulus be allowed to escape through an incision in the bowel, but the distended intestine above the volvulus must be evacuated of its putrefactive accumulation in order to prevent the risk of autoinfection. This evacuation of the bowel above the constriction is notably aided by irrigation of the distended coils of intestine through the opening. Once the volvulus has been emptied of its contents reduction of the twist is almost invariably possible, and in no instance has the writer known the twist to recur. Many surgeons now advise closing the incision in the bowel and the return of the latter into the abdominal cavity. The writer admits freely that this is the ideal course to pursue, but confesses that he has never dared to follow it. He has always ligated the margin of the incision in the bowel to a glass tube and drained the distended and damaged bowel for several days. In most cases in which the patient has recovered, the fistulous opening in the bowel has closed spontaneously at the end of some weeks.

In the worst cases it is obvious that gangrene of the strangulated loop of bowel has occurred, and the condition of the patient is always extremely perilous. The ideal treatment would appear to be resection of the gangrenous intestine and union of the proximal and distal segments of the bowel either by end-to-end or by the far safer lateral anastomosis. This treatment the writer has never ventured to carry out. In every case of gangrenous volvulus that has come under the writer's care the condition of the patient has appeared to him too desperate to warrant a prolonged operation. He has always in such cases been contented with bringing the gangrenous bowel and a piece of healthy intestine on each side of it outside the abdominal cavity. In such cases as have recovered he has performed resection subsequently.

REVIEWS.

A Text-book of the Diseases of the Ear. For Students and Practitioners. By Professor Dr. Adam Politzer. Translated at the personal request of the author, and edited by Milton J. Ballin, Ph.B., M.D. Fifth Edition, Revised and Enlarged, with 337 Original Illustrations. Lea & Febiger, Philadelphia and New York, 1909.

The six-year interval between the fourth and fifth editions of Professor Politzer's book on Diseases of the Ear has been productive of noteworthy observations by the world's most capable aurists, the results of which have in no wise been overlooked by this eminent authority in the thorough revision which marks the recent edition of his already illustrious work.

In the rewriting of each chapter the author has been as careful in the elimination of every prolix paragraph as he has in the addition of recent deductions, thus keeping the book down to its original size, as well as providing the reader with instruction as condensed as is commensurate with assured clearness.

The Internal Ear, considered both physiologically and pathologically, is the subject which shows the most marked transformation under the test of recent clinical observation, the results of the author's personal experience being fully set forth in the text, furnishing principles of importance not only to the aurist but to the neurologist as well.

On the whole, maintaining even to a more marked degree the high standard of the previous editions, it would seem that replete as is the portrayal of anatomic relations; rational as are the conclusions touching physiologic functions; precise as is the setting forth of pathologic processes; clear the

enumeration of causes, possible complications, and the data concerned in diagnoses—the chief charm of the book still lies in the author's attention to treatment, his perfect technique and postoperative care of the patient.

It is a guide that can be followed by the student in college and the "finished" physician, as well as the specialist, with pleasure and profit. G. L. D.

BIER'S HYPEREMIC TREATMENT. By Willy Meyer, M.D., and Prof. Victor Schmieden. Second Edition, Enlarged. The W. B. Saunders Company, Philadelphia, 1909. Price $3.00.

The appearance of a second edition of this book within ten months after the appearance of the first edition is a proof that it has filled a need in the medical literature of this country. Bier's Hyperemic Method of Treatment has now taken a definite place in surgery, and although it has very distinct limitations, as its most enthusiastic supporters freely state, it brings relief to a number of conditions which cannot be treated so successfully by any other measures. The present volume is copiously illustrated, showing the conditions and the apparatus used for their relief. Notwithstanding the enthusiasm of the authors in advocating their method, they are wise enough to point out that it has limitations and if used too often may do harm. The book closes with copious references to the literature and with a list of names of those who have made notable contributions to this subject, and who are quoted in the text. We have no doubt that the second edition will prove as popular as the first.

COMMON DISORDERS AND DISEASES OF CHILDHOOD. By George Frederic Still, M.A., M.D., F.R.C.P. Henry Frowde, London, 1909.

This volume covers nearly 800 pages and consists chiefly of lectures delivered at various medical schools and hospitals in London upon diseases of children; that is to say, the various chapters are founded upon the remarks made under these circumstances. Particular emphasis is laid upon the clinical aspects of disease with reference to diagnosis and treatment, but pathology and morbid anatomy are by no means ignored, particularly when their full discussion is of value in explaining the other parts of the book. As with most books upon diseases of children the opening chapters deal with infant feeding and with diseases which result from faulty feeding, including disorders of digestion and metabolism. After this the common diseases of children, such as bronchopneumonia and its complications, rheumatism, heart disease, renal and nervous diseases, receive careful consideration.

The book is an excellent one for the practitioner, but is not designed for the student in the sense of being a text-book. It is, however, an excellent means of affording collateral reading and study which will be of value to practitioners and students, particularly if they are devoting much attention to these important subjects.

STUDIES ON IMMUNITY. By Robert Muir, M.A., M.D. Henry Frowde, London, 1909.

We are told in the preface of this book of 216 pages that its contents consist chiefly in an account of the researches which have been carried out in the Pathological Department of Glasgow University and the Glasgow Western Infirmary. As a matter of fact the contents is really the appearance in book form of material which has already been published in various journals, chiefly the *Lancet*, the *British Medical Journal*, the *Journal of Hygiene*, and the *Journal of Pathology and Bacteriology*. The first part of the book deals with the properties of hemolytic sera, and the second with the properties of antisera and the deviation of complement and its relation to the precipitin test. The third part discusses the antibacterial properties of serum and completes the volume.

INBORN ERRORS OF METABOLISM. By Archibald E. Garrod, M.D., M.A. Henry Frowde, London, 1909.

The contents of this small volume of less than 200 pages are the Croonian lectures delivered before the Royal College of Physicians in London in June, 1909, by Dr. Garrod, who is well known for his investi-

gations in this complex part of medical work. The first chapter deals with inborn errors of metabolism, and then five others follow upon various disorders of metabolism which are acquired or are in part hereditary. Books of this character, which aid in correcting the medical mind as to the fad of uric acid, deserve recognition and wide reading.

GRAPHIC METHODS IN HEART DISEASE. By John Hay, M.D., M.R.C.P. With an Introduction by James Mackenzie, M.D., F.R.C.P. Henry Frowde, London, 1909.

As is evident from the title this book deals with the various modern methods of obtaining tracings and other records of the action of the heart and of the pulse. Dr. Mackenzie is the foremost English investigator along these lines, and has given his approval to the text. We know of no volume which can be put into the hands of one who wishes to carry on investigations along these lines with greater confidence than this unless it might be McKenzie's own publications. Typical and atypical tracings are found scattered through the book, with carefully prepared legends and descriptions as to their meaning and significance.

THE MEDICAL INSPECTION OF SCHOOLS. By A. H. Hogarth, M.B., B.Ch. Henry Frowde, London, 1909.

The scope of this book is confined to the needs of elementary schools, and the volume is prepared because the medical inspection of schools is so universally recognized as essential in the rearing of children. The book gives useful information in regard to medical inspection of schools in other countries than England, and with care details the duties of the medical inspector and the diseases affecting school life.

THE PRINCIPLES OF PHARMACY. By Henry V. Arny, Ph.G., Ph.D. The W. B. Saunders Company, Philadelphia, 1909. Price $5.00. Illustrated.

In the preparation of this exhaustive textbook the author has of course frequently referred to standard classical publications, to which he gives full credit in his preface. The book covers the field commonly covered by writers upon this subject, starting out with a discussion of the various weights and measures and the scientific and other physical apparatus which are commonly used by pharmacists. Part II deals with galenical preparations; Part III with inorganic chemistry; Part IV with organic chemistry; Part V with pharmaceutical testing; Part VI deals with prescriptions and the methods for compounding the same; and Part VII is devoted to laboratory exercises for the student. As the book is designed solely for pharmacists it is in no sense devoted to therapeutics, and is of little value to medical men except in so far that it is a useful work of reference when pharmaceutical questions arise.

MYOMATA OF THE UTERUS. By Howard A. Kelly, M.D., and Thomas S. Cullen, M.D. Illustrated by August Horn and Hermann Becker. W. B. Saunders Company, Philadelphia and London, 1909.

This admirably illustrated book is fundamentally a clinical study of some 1600 odd cases of myoma operated on by Dr. Kelly and Dr. Cullen in the course of the last twenty years. It is noteworthy that whilst the total mortality is between 5 and 6 per cent, this including not only the early cases but many associated with malignancy, that of 238 cases operated on in the last three years is less than one per cent, which the authors regard as an evidence of continued improvement in operative technique.

In a study of the cases it is noted that 17 exhibited sarcomatous changes. In these cases sarcoma was not suspected until the uterus was opened, hence they advise that in every case in which a supravaginal hysterectomy is deemed preferable the uterus be opened immediately after removal, so that if by chance a malignant growth be present the cervix can be removed without delay. One case is reported in which two years after a supravaginal hysterectomy the patient had definite signs of intra-abdominal hemorrhage. At operation a large sarcoma was found developing from the cervical stump.

When the growth is not entirely removed operation evidently hastens the end. It

seems probable when supravaginal hysterectomy is done, the sarcomatous growth is transplanted in various directions by the knife, and that it commences to grow with increased vigor.

The immediate results following hysterectomy for sarcoma are not gratifying. There seems to be great danger of infection, and if utmost care be not exercised a local or general peritonitis will develop from the necrotic and frequently sloughing sarcomatous growth.

Eighteen cases are reported in which the myomatous uterus was also the seat of carcinoma of the cervix. In 25 cases adenocarcinoma was detected in the body of the uterus. The histories indicate that in most of the cases the myomata have been present for several years; that for some months or a year before admission uterine hemorrhages had been noted; and that between periods there had been a watery and offensive vaginal discharge.

In 934 cases of uterine myoma in which it was necessary to remove the uterus normal tubes were present in 482 cases, whilst one or both tubes were adherent in 123. In 94 of these there were dense tubal adhesions. In the majority of the cases it was noted that the bladder had retained its normal position; not infrequently, however, it had been carried up into the abdomen. When the interstitial myomata had spread between the folds of the broad ligament the ureter was often dislodged and lay upon the surface of the tumor. In a moderate number of cases slight or dense adhesions were found around the tumor and the rectum. These adhesions may occur when the appendages are normal, but are usually associated with general pelvic adhesions and are particularly prone to occur when a pelvic abscess exists. The rectal adhesions may be low down near the cervix or may be limited to the sigmoid flexure.

As to the frequency of myomata, it is noted that including the autopsies upon women of twenty or over, of which there were 742, 148 exhibited myomata. In other words, in about 20 per cent of the women of twenty years or over the uterus was the seat of myomatous growth; of all the black women twenty years or over coming to autopsy, 33.7 per cent had uterine myomata, while only 10 per cent of the white patients were affected in this way. One case is recorded in which tuberculosis of the Fallopian tube coexisted with uterine myomata in the autopsy findings.

As to the cause of uterine myomata, it is stated that these tumors are commonest during the child-bearing period, and that of 1149 women thus afflicted 584 were sterile. Of the sterile patients 295 were married and 289 single. The theory advanced as to etiology is that the uterus must have something to do, and if not kept relatively busy as a result of frequent pregnancies, it may tend to show its activity in another direction, namely, in the formation of myomata. The youngest patient recorded was nineteen years of age, and twenty-six patients were under twenty-five years of age. The oldest patient was seventy-one. The great preponderance of the cases came to operation between twenty-eight and fifty-two years of age.

Increased size of the abdominal veins associated with myoma is rare. In the last number of cases the menstrual function was in no way influenced by the presence of the myomata, often the flow was even diminished. Where the menstrual flow is excessive and often associated with an intermenstrual discharge the myomata were of the submucous variety. The authors hold that in nearly every case the uterine bleeding is due to the encroachment of one or more uterine myomata on the uterine mucosa. No matter how large the myomatous uterus, provided the contour of the uterine cavity is not altered and the mucosa in no way impinged upon by the myomata, there will rarely be any disturbance in the menstrual function.

If it is possible to exclude the presence of uterine polypi, which frequently cause hemorrhage, of diffuse adenomyomata, which are associated with profuse menstruation but with little or no intermenstrual bleeding, and adenocarcinoma, which occasionally accompanies uterine myomata, one

can say with almost absolute certainty that the uterine hemorrhage which occurs in association with the myomatous uterus is due to a tumor of the submucous variety.

Constipation and hemorrhoids are very commonly associated symptoms. In the vast majority of cases the breasts show no change, though the patients as a rule experience pain. In a number of cases there is edema of the lower extremities, at times associated with low hemoglobin percentage.

There is an excellent chapter on Differential Diagnosis and a singularly lucid description of the Operations of Abdominal and Vaginal Myomectomy, together with a section devoted to Complications Following Hysterectomy.

The results of 1373 radical operations are given in detail.

This is a truly admirable clinical study, and one likely to be helpful to every operating surgeon.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

The committee which is sitting to consider the Daylight Bill had the pleasure of hearing the evidence of Sir Thomas Barlow, physician to the King's household. Sir Thomas told the committee that he was in favor of an alteration in the hours of the day as has been suggested, because it gives the people of London and of England generally a chance to live a more natural life by getting as much fresh air as possible. He laid considerable stress on the good effects derived from sunshine and air, and pointed out that one reason why many of the poor children of London keep so well, and are often in better health than the similarly aged children of the well-to-do, is because they spend so much time in the open air, even though they play in front of a slum, or are employed in making mud pies. He also concluded that the adoption of the bill would diminish the use of artificial light, and considered that daylight is a safeguard for the protection of the eyesight.

The most important argument from a medical point of view is that more time would be available for open-air games, exercises, and for military drill. This latter aspect of the case is now before the public, as we have in London several Territorial Field Hospitals and a Sanatory Company, and all the various territorial units have as well their own medical officers. At different centers in London there are drills for the officers and men taking up this work, on three or four evenings in the week, and July and August will see the exit of these contingents to such places as Bisley, Salisbury Plain, Aldershot, etc., for the annual camping. The men will be in camp for a period not less than a week, and during that time there will be parades, drills, and general work to bring the units up to an efficient state. Besides the good moral effect derived from drilling, this time spent in camping provides an excellent holiday and more fresh air than the individual would otherwise get, but it is not entirely a time of relaxation, as the men have to put in a considerable amount of time over their drills, etc. The medical units for the county of London are now nearly up to full strength, and the enlistment since April has been fast and very satisfactory.

In my last letter I mentioned the Conference on Tuberculosis which was being held in the .Whitechapel Art Gallery. Among the most interesting papers was that of Dr. Paterson, superintendent of Frimley Sanatorium, who has instituted the treatment of pulmonary tuberculosis by the employment of "graduated labor." He treated the subject in a practical and popular manner, detailed the reasons which led him to introduce the system, and went on to describe the actual measures employed. Great stress

was laid on the performance of work which was useful and which had an object in view. The first stage in the treatment was simply walking, then the gradual increase of the distance, which was followed by carrying baskets of definite weights, and later by the use of workmen's tools for the performance of different grades of work. Promotion from one type of work to a higher was dependent upon satisfactory temperature, good appetite, and a general feeling of well-being. He remarked that the physical improvement always led to an improved mental attitude, and from being sallow and apathetic the patients became lively and cheerful. The temperatures were carefully taken, and if any rise occurred the individual was put back to bed. He said that the difficulty in the management was that no hard and fast rule for the gradual increase of the work could be laid down, since experience showed that the heavier the work they could get the patient to do without any deleterious effect, the better were the results. Patients on the lighter work treatment often did not show improvement till they were put on to more arduous tasks. Finally he entered into the theoretical discussion of autoinoculation, and this part of his lecture was made very interesting by the exhibition of sundry diagrams.

Dr. Jane Walker has been trying the same treatment for women, and is able to confirm the beneficial results. The light labor treatment that her women patients undertook, however, consisted of general household duties, and after these had been done for the day time was devoted to lace-making and gardening. She described the details of the work fully. We understand that the exhibition was well attended and was distinctly successful. The only fault to be found is that it has not been sufficiently advertised.

The profession has lost a distinguished member in Dr. D. J. Cunningham, Professor of Anatomy, University of Edinburgh. He had a most distinguished career and received many honorary degrees from different universities—Oxford, Dublin, etc. He is best known for the text-book on Anatomy, which was and still is in general use among students. This book, which is very full and yet so well written as to be very easily read and appreciated, has given him a world-wide reputation.

Among the honors which the King has been pleased to bestow on the occasion of his birthday are the following: Sir Dyce Duckworth receives a baronetcy. Mr. Henry Morris, President of the Royal College of Surgeons of England, also receives a baronetcy. Sir Henry has spent a considerable amount of time and energy in furthering the interests of the Imperial Cancer Research. Lieutenant-Colonel W. B. Leishman receives the honor of knighthood. He is chiefly known for his research work in tropical medicine and as a teacher in the Royal Army Medical School. There is also a special stain associated with his name. These are the principal medical honors which have been conferred.

Thursday, June 24, saw the annual medical golf tournament, which was this year held at Burnham Beeches. The links are beautifully situated on the downs and flanked by woods, the only objection being their inaccessibility. We all had a most enjoyable day in spite of the fact that sundry heavy showers fell in the early morning and also late in the evening. Leaving London at 9.15 A.M. we returned about 7 P.M. quite content and rather tired. In the morning there was a bogey competition on handicap, and in the afternoon a foursome sweepstake.

AN EXPERIENCE WITH ANTISTREPTOCOCCIC SERUM.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I wish to report a case which I think will be of interest, both on account of the high temperature, with recovery, and also demonstrating the value of antistreptococcic serum. Mrs. H., aged twenty-eight, married twelve years, had the usual diseases of children. She first menstruated at the age of fifteen, was never regular, often missing five, seven, nine, and as long as thirteen months. She was confined on

April 5, 1909, after ten hours of normal labor; had no lacerations, but on account of the flabby condition of the uterus I gave thirty minims of fluid extract ergot every four hours. Her abdomen had been stretched to such an extent that it was painful to the touch. She progressed normally until the 8th at 2 A.M., when the nurse telephoned me that she had a temperature of 102°. Thinking it due probably to accumulations in the bowels, I directed a saline to be given, and found the temperature normal next morning, appetite good, bowels in good condition. This was Thursday, and in the afternoon the temperature rose again, and that evening I irrigated the uterus with hot creolin solution, and every day thereafter. She had a chill on Friday and Saturday, with a rise of temperature, and Saturday evening I curetted with dull curette and brought away some semisolid blood and mucus. Temperature fluctuated from 101° to 104°. On Sunday, at 5 P.M., she complained of feeling cold, and I had just finished irrigating her uterus when she developed one of the hardest chills I ever witnessed. I gave her a No. 2 H. M. C. hypodermic, which checked the chill in a few minutes. She remarked, "Why did you not give me that before?" That was the last evidence of consciousness she had for twelve hours. The temperature rose rapidly, and on taking it in the axilla I was dumbfounded to find it was 109°. The pulse was 100 and small.

We immediately got busy and wrapped her in wet towels and rubbed her with ice, and in one-half hour the temperature fell to 105°, then rose to 106.5°. The pulse was still rapid and weaker. I gave her a hypodermic of digitalin, nitroglycerin, and strychnine, and one teaspoonful of whisky, hypodermically every twenty minutes. I immediately sent for two tubes of antistreptococcic serum and gave 10 Cc., and repeated it in ten hours. The next morning consciousness had returned, the temperature was normal, the pulse 94°. The patient was weak, with slight headache. Temperature rose in the afternoon to 104°. Unfortunately there was no more serum obtainable, and thirty hours intervened before a new supply could be had. Tuesday evening she received 20 Cc., 20 Cc. on Wednesday, and as the temperature was still up Thursday morning I gave her 20 Cc. at one dose, and in the afternoon her temperature was normal for several hours, but rose toward the evening, when she received 10 Cc. more. On Friday she also received 20 Cc. Her temperature gradually fell, and she began to improve from the first dose. I believe if I had had a sufficient supply at the start I could have controlled the disease sooner.

I have used this serum in another case which developed a sapremia on the eighth day after confinement, with equally good results. The temperature in the last case did not go above 104.5°. If I have occasion to use the serum again, I would not hesitate to use 30 or 40 Cc. at one dose, as the 20 Cc. given in the case at one dose demonstrated that the former doses were too small. I used P., D. & Co.'s serum. After the injection she would quiet down and sleep as though she had taken a sedative. She developed a rash about one week after using the serum, which is nothing unusual. In two weeks after the first injection she was able to sit at the table and eat her meals with relish. Mother and child at this writing are both well and strong.

H. M. FAGAINES.

CHANDLER, OKLAHOMA.